

KENTUCKY
GEOLOGICAL SURVEY

FOURTH SERIES
VOLUME TWO

PART TWO

J. B. HOEING, State Geologist

FRANKFORT, KY.
1914



THE STATE JOURNAL COMPANY
Printers to the Commonwealth
Frankfort, Ky.

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**REPORT
ON THE COALS OF
MACIES AND LEATHERWOOD CREEKS,
PERRY COUNTY.**

BY

JAMES M. HODGE

1914

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THE COALS OF MACIES AND LEATHERWOOD CREEKS.

The area covered by this report includes the drainage basins of Macies and Leatherwood creeks and also that of the North Fork, Kentucky River, lying between those streams. It covers the southern part of Perry County, and embraces about 90 square miles.

The report embodies the results following recent visits to all coal openings of the region which were open at the time to examination and numerous others which had become more or less covered. To the information so required has been added that obtained on former visits, the whole giving as complete knowledge of the field as the present state of development permits.

Correlations have been established with a sufficient degree of certainty for most of the lower coals, but, with several similar beds of the higher coals in close juxtaposition and openings far apart it is not unlikely that more thorough investigation may lead to a change from some of the correlations here advanced. It is believed, however, that such changes will not alter materially a general estimate of the field.

The accompanying maps, of the two creeks, made from recent surveys by the Kentucky Geological Survey, give, in addition to altitudes along the streams obtained by spirit level, others of coal openings obtained by aneroid barometer, consequently approximate only, but seldom far amiss as they were derived from the true altitudes along the creeks as a base.

The topography of the region is similar to that of Eastern Kentucky generally, the steep hills enclosing narrow valleys rising 500 to 1,000 feet to sharp ridges.

Strata in outcrop in the region are from about 50 feet below the Amburgy coal bed to some 300 feet above the Hindman coal bed, the total thickness nearly corresponding with the height of the highest hills.

The prevailing dip is northwestward, but on some of the branch streams flowing eastward, the larger ones especially, a reverse or a northeast dip is found. The average rate of dip from the mouth of Macies creek to the head of Leatherwood is about 50 feet per mile. The steepest pitch in the field is probably not over 100 feet per mile.

The succession of principal coal beds in outcrop and the approximate intervals between them are given following in descending order:

- Hindman Coal Bed.
Interval, 150 to 200 feet.
- Flag Coal Bed. (Locally No. 7.)
Interval, 40 to 50 feet.
- Hazard Coal Bed. (Locally No. 6.)
Interval, 60 to 100 feet or more.
- Haddix Coal Bed. (Locally No. 5.)*
Interval, 200 feet.
- Fire Clay Coal Bed. (Locally No. 4.)
Interval, 60 to 70 feet.
- Whitesburg Coal Bed.
Interval, 130 to 140 feet.
- Amburgy Coal Bed.

The Elkhorn coal, mined at Jenkins and McRoberts, is about 200 feet below the Amburgy bed, and therefore below drainage and of unknown bed section.

The Amburgy coal bed, of especial importance on Carr fork, is barely of workable thickness on Leatherwood creek, where only in this region it appears above drainage. Lying about at river level at the mouth of that creek and rising with the drainage over 2 miles up Little Leatherwood and for 8 miles up the main creek, such thickness as it has is easily accessible. The bed is thin, however, towards the mouth of the creek and, with no intermediate openings, shows workable thickness only just before going below drainage on the main creek.

*A coal, the "Young" coal of a former report, comes between the Haddix and Hazard beds and is occasionally more prominent than the Haddix. It is possible that in a few cases, where the interval between the Hazard and Haddix is apparently decreased, the coal called Haddix herein may possibly be the Young coal with the Haddix unopened lower in the hill.

The Whitesburg bed has been found at a few points only and at none of them in satisfactory condition, as the coal thickens partings increase. Its black slate roof, common elsewhere over a large area is, on Macies creek, a black shale and on Leatherwood a brown shale.

The sandstone between the Whitesburg and Fire-clay coals, which is especially noteworthy for its hardness over much of Kentucky river areas has lost that feature in this locality, and the bench of the latter coal is rarely prominent.

The Fire-clay coal is about 150 feet above the river at the mouth of Macies creek. On the Right fork are several openings with thick coal injured by partings, but the bed soon goes below drainage farther up the fork with diminishing thickness. On the Middle fork the thickness holds at about 3 feet above the flint clay parting below which is a foot, more or less, of coal. The bed continues above drainage for 4 miles or more, but no opening into it appears to have been made beyond $2\frac{1}{2}$ miles up the Middle fork. Lack of openings on the Left fork is rather indicative of thinning in that direction, but the bed goes under the fork in about 2 miles.

Along the river from Macies creek to Leatherwood it appears that about 3 feet of coal in the upper seam can be counted upon, but the lower seam of the bed is either lacking or likely to be much injured by partings.

On Leatherwood creek and its branches from the east the bed is above drainage nearly to their heads. The flint clay is usually the bottom of the bed, out of sight and not easily discovered without suitable tools, so that in many cases this means of identification was not available. Over the clay is generally $2\frac{1}{2}$ to 3 feet of coal, the excellent character of which seems usually to be maintained. While higher beds are thicker this one will probably supply the major part of the coal of this region.

The Fire-clay coal rider appears to be partly merged into the main bed on Macies creek, partly cut out altogether there and at other points on the river and on Leatherwood creek, and, though thick enough to work on Little Leatherwood, the bed is of little importance. Sometimes associated with several other thin coals in the 60 feet above the Fire-clay coal, it is occasionally difficult to distinguish it from them. A well defined bench on the

Leatherwoods, 30 to 40 feet above the Fire-clay coal, should help to do so on further development. Sometimes these coals seem to be obliterated by a heavy sandstone resting on the Fire-clay coal.

A coal 100 feet above the Fire-clay coal, not known to be of workable thickness elsewhere, is especially to be noted because of the fine appearance of its 32 inches of coal on Clover fork, Leatherwood creek.

The sandstone underlying the Haddix bed (containing pebbles on Clover fork of Leatherwood) becomes the most prominent in this region, showing cliffs such as those above that coal bed noted in previous reports, but apt to be higher and with rougher faces.

The Haddix coal is of very uncertain value here as elsewhere on account of variation of the bed and difficulty in getting to it through its envelope of loose rock broken from its sandstone covering at the outcrop. Several openings into the bed on Bark Camp branch of Leatherwood creek, where it has large area, show $4\frac{1}{2}$ to $6\frac{1}{2}$ feet of coal, and still thicker coal is found in the bed across the ridge on Line fork.

Between the Haddix and Hazard beds is the place for the Young coal, seldom of workable thickness.

The sandstone overlying the Haddix bed is, perhaps, as prone to cliff-making as it has been found elsewhere, but the cliffs give little aid in correlation as they here resemble too closely those of the sandstone below.

The Hazard bed is probably of workable thickness throughout most of the right fork of Macies creek, but its height in the hill and restricted area with coal of only moderate thickness, do not make, under the present slight development, an attractive exhibit. On the head of the Middle fork the coal is thick enough but areas are small. Lack of development on the Left fork, with rather thin coal in the river hill below Leatherwood, is not promising for those localities.

On Leatherwood creek farther south than the mouth of Owen branch, this coal seems to be generally thick with sufficient areas for working on Beehive branch and Clover fork, and of increasing areas southward to Kentucky ridge, where the area is large notwithstanding a rapid rise of strata to it.

The Flag coal has workable thickness wherever found, but its openings are few, its height renders areas generally small and its correlation is somewhat uncertain.

The cliffs above the Flag coal which are particularly striking in capping ridges in northern Perry county have not that predominance in this region. The high sandstones are still in evidence, but they have lost the endurance which characterizes cliff-making rocks.

The Hindman coal bed, found in this region only on the heads of the Right fork of Macies creek, has good thickness but without much area. Kentucky ridge offers area enough to warrant search for the bed, which as yet appears not to have been made there.

Cannel coal is almost wholly lacking in this field, the only cannel seen being in a thin bed on Stony fork. Occasional reports of it elsewhere seemed to refer rather to cannel slate or to a very thin coal bed.

The following pages give details of openings visited and such other matter as seemed to merit notice. Each stream and its branches is taken in succession from its mouth to its head, the terms left and right being used as when looking up stream.

Surface distances given in miles are on the main streams taken from the maps of the streams and are slightly longer than the corresponding distances by road. Distances on branch streams are more roughly approximate. Underground distances, in yards, are given without attempt at accuracy, but are not wide of the mark. Entries inaccessible because of water are denoted wet entries, those where the faces were not seen are called long entries. Thicknesses of strata given in feet are approximate only; given in inches they may be relied upon as correct.

MACIES CREEK.

MACIES CREEK.

RIGHT FORK

On the right, $\frac{1}{4}$ mile up Macies creek: Altitude of mouth, 885.

On the right, $\frac{1}{2}$ mile up a right branch, $\frac{1}{4}$ mile up this fork, on the John Babcock land (later Burt and Brabb Lumber Co.), is an entry into the river hill which gave the following bed section:

Flag Bed.

Shale	3 Feet.
Coal	16"
Clay	1"
Coal	41"
Altitude, 1,450.	

Much of the upper two feet of the lower seam is splint coal; the lower 14 inches was measured under water and may contain a small parting. The correlation here is somewhat uncertain as it involves a rise of strata of about 100 feet from the mouth of the branch, against the prevailing dip but with the drainage. The bed here has enough covering over it to provide a fairly good working area.

On the left, a mile up the Right fork, Finley Hendricks has a 12-yard entry into the Fire-clay coal, and below it, 5 feet above the creek, the Whitesburg bed is exposed. The sections there, and at John Hall's 8-yard entry into the Fire-clay bed follow, the latter entry being on the left $1\frac{3}{8}$ miles up the creek.

Fire-clay Coal.

Hendricks.		Hall.	
Sandstone	15 Feet.	Sandstone	40 Feet.
Coal	2"	Black shale	1 Foot.
Shale	13"	Coal	3"
Coal	8"	Shale	2 Feet.
Shale	1"	Coal	1"
Coal	1"	Shale	3"
Shale	2"	Coal	4"
Coal	3"	Shale	11"
Shale	2"	Coal	14"
Coal	38"	Shale	6"
Flint fire-clay	4"	Coal	24"
Coal		Flint fire clay	5"
		Coal	13"
Altitude, 990.		Altitude, 1,010.	

Whitesburg Bed.

Shale	1 Foot.
Black shale	5 Feet.
Coal	6"
Shale	7"
Coal	10"
Shale	5 Feet.
Altitude, 940.	

In the Hendricks entry, measured at its face, the flint clay and coal under it are not taken up. In the Hall entry they are taken up two yards in and the bed-section was obtained there. At both entries the upper parting contains iron-ore nodules.

On the right of the creek and road, $1\frac{1}{4}$ miles up, two abandoned entries into the Fire-clay coal show about 40 inches of coal under 2 feet of shale and coal with thick massive sandstone above.

An old opening, $1\frac{3}{4}$ miles up the Right fork, gave but 22 inches of coal in the Fire-clay coal bed, divided one foot down by a fire-clay parting of 4 inches. While it is not unlikely that this sudden reduction from the sections for this bed just given is partly due to an out-crop squeeze of the upper portion of the section, a workable bed cannot be fully relied upon farther up the creek.

BIG BRANCH.

On the right, $1\frac{7}{8}$ miles up the Right fork: Altitude of mouth, 1005.

On the left, $\frac{1}{2}$ mile up this branch, on John Pratt's land, an incomplete opening has been made into the Flag bed, apparently, which gives the following section almost identical with that into the same bed on the hill behind the town of Hazard. Farther opening into the bed may give an improved section.

Flag Bed.

Shale	
Coal	21"
Shale	3"
Coal	10"
Shale	1"
Coal	5"
Altitude, 1,460.	

This bed lies on a sandstone exposed in a cliff nearby, and 135 feet below it is the top of another cliff on which is the Haddix bed.

At $2\frac{1}{4}$ miles up the Right fork the Fire-clay coal is 30 feet above the creek, on the right, and there has 20 inches of coal under the fire-clay parting and 12 inches above it, and still more in what appears to be the roof, but from this point a roll carries the bed rapidly down into the creek, cutting out with sandstone much of the upper coal. Coal has been taken from the creek here, at altitude 1020, but its thickness is not known.

On the left of a right branch, $2\frac{3}{4}$ miles up the Right fork, $\frac{1}{4}$ mile up the branch, a prospecting cut in the point of a small spur gave 2 feet of coal and shale under 5 feet of shale and with a sandstone cliff slightly higher. At altitude 1315, about 300 feet above the Fire-clay coal, it is evidently of the Hazard bed. The opening was made where the coal may not show full thickness, and the cut was not carried in far enough to distinguish between coal and shale.

WOOTEN BRANCH.

On the right, 3 miles up the Right fork: Altitude of mouth, 1050.

On the right, at the branch, $\frac{1}{2}$ mile up it, is the following exposure containing what appears to be the Fire-clay rider:

Shaly sandstone	8	Feet.
Coal	14"	
Clay	1½	Feet.
Red shale	1	Foot.
Coal	2"	
Soft clay shale.....	4	Feet

At $\frac{3}{4}$ mile up the branch, and in it, is a foot of coal and shale under 8 feet of shale, the upper half sandy and the lower half clay shale. Strata rising for a short distance with the branch this, at altitude 1110, may be of the same bed as that next preceding.

On the right, one mile up the branch, beside the road to Cutshin creek, a wet entry gives at its mouth the following section:

Hazard Bed.

Sandstone	5	Feet.
Shale	1	Foot.
Coal	27"	
Black slate	6"	
Coal	2"	
Altitude, 1,295.		

On the head of Wooten creek, on the Cutshin creek side of the ridge from this last opening, is another one, unfinished, giving 18 inches of coal, parted four inches from the top by one foot of clay containing coal. This, at altitude 1305, is probably also of the Hazard bed.

On the right, $3\frac{1}{4}$ miles up the Right fork of Macies creek, a closed entry into the Hazard bed gives 39 inches of coal under 8 feet of soft shale at altitude 1325. The top of a 25-foot cliff above the entry is at altitude 1365.

At J. P. Caudill's, $3\frac{1}{2}$ miles up, on the right $\frac{1}{4}$ mile up a left branch, the top of the same cliff is at altitude

1380, and another coal, the Flag bed, shows 20 feet higher, making it here about 60 feet above the Hazard bed.

The following section is taken from my early report of coals found near Farler Postoffice at the forks, 4 miles up the Right fork; altitudes corrected to conform to recent leveling.

Interval to top of hill, 50 feet.		
Sandstone	5	Feet.
Coal	7"	
Coal and shale	12"	Altitude, 1,545.
Clay		
Interval.		
Sandstone	60	Feet. Altitude, 1,465.
Interval.		
Sandstone	20	Feet. Altitude, 1,425.
Interval.		
Shale	5	Feet.
Coal	4"	
Shale	9"	
Coal	4"	
Shale	6"	
Coal	7"	Altitude, 1,395.
Interval.		
Shale		
Coal	13"	Altitude, 1,360.
Sandstone	5	Feet.
Interval.		
Coal Stain		Altitude, 1,345.
Interval.		
Sandstone and shale.		
Coal and shale	20"	
Coal	15"	Altitude, 1,165.
Interval.		
Black slate	13"	
Coal	15"	
Clay	2"	
Coal	12"	Altitude, 1,150.
Interval.		
Right fork at Farler		Altitude, 1,110.

FIELDS FORK.

On the left, 4 miles up Right fork: Altitude of mouth, 1110.

A mile up this fork to its first forks, a mile up the right fork there to the second forks, $\frac{1}{2}$ mile up second

right fork to Jason Fields, and on the left, $\frac{1}{8}$ mile up the right branch there, is his entry into the Hindman bed.

The total thickness of bed is about $6\frac{1}{2}$ feet, so far as could be made out, with coal and partings similar to those in Dehart's entry, on another head of the Right fork, given on a succeeding page. The lower foot of the bed was covered by water. Upon the coal is a foot of clay and then 10 feet of sandstone. It is too near the top of the hill to give workable area, so far as seen, being at altitude 1750.

A prominent bench lies 50 feet lower and the top of a cliff, 390 feet lower, at altitude 1360.

WELLS FORK.

On the right, 4 miles up Right fork: Altitude of mouth, 1110.

On the left, $\frac{1}{8}$ mile up this fork are two wet entries, giving, under sandstone, a bed some 60 feet above the Fire-clay coal, with coal slightly less than obtained in the section just given.

By A. L. Dehart's house, at the head of Wells fork, $1\frac{3}{4}$ miles up and in it, is a pit from which coal of the Haddix bed, at altitude 1350, has been taken. The sandstone under it gives a broad bench as soon as the creek has cut through it. Sandstone lies also close above the coal.

On the right from this coal is a 20-yard entry, which, measured two yards in, gave the following bed-section. Because of the excellent showing here the bed is locally called after the name of the owner (past or present).

Hindman Bed.

Sandstone	40	Feet.
Coal	16"	
Shale	6"	
Coal	11"	
Shale	1"	
Coal	9"	
Shale	2"	
Coal	35"	
Clay		
Shaly sandstone	2	Feet.
Altitude, 1,680.		

On the right of Macies creek, $\frac{3}{8}$ mile from its mouth, $\frac{1}{8}$ mile above the Right fork, John H. Hall (formerly William Singleton) has an entry into the Fire-clay coal, in which measurements given below were taken.

On the left, $\frac{1}{2}$ mile up, Eli Hall has an opening into the same bed, which has been mined wide under a cliff and is now partly filled. Where posts were put to support the clay roof the clay has fallen away, leaving an open space between the top of the posts and the sandstone above them. A wedge of sandstone runs down through the clay to the coal, and also, in part, thin sandstone overlies the coal with the clay still above it. The bed-section here is given following:

Fire-clay Coal.

J. H. Hall.		Eli Hall.	
Sandstone	10 Feet.	Sandstone	10 Feet.
Coal	28"	Clay	0 to 4"
Flint fire-clay	5"	Coal	33"
Coal	8"	Flint fire-clay	4"
Black slate	3"	Coal	7"
Bone coal	2"	Shale	5"
Altitude, 1,020.		Coal	2"
		Shaly sandstone	20 Feet.
		Altitude, 1,025.	

Henry Campbell (formerly Woolvey Campbell) has a new 12-yard entry, on the right, $\frac{1}{2}$ mile up the creek, with bed-section as follows; and an old one on the right, $\frac{3}{4}$ mile up the creek with bed-section as taken formerly, also following. Coal from this entry is now used by the locomotive carrying timber and lumber along the creek.

Fire-clay Coal.

New Entry.		Old Entry.	
Sandstone	8 Feet.	Coal	35"
Coal	34"	Flint fire-clay	5"
Flint fire-clay	4"	Coal	13"
Coal	7" +	Shale	2"
Bottom of bed not reached.		Coal	9"
Altitude, 1,020.		Altitude, 1,020.	

MIDDLE FORK.

On the right, one mile up Macies creek: Altitude of mouth, 915.

On the right, $\frac{3}{8}$ mile up this fork, Benjamin Cornett has a 10-yard entry into the Fire-clay coal bed with 49 inches of coal and a parting of brown flint fire-clay 36 inches from the top, the upper seam of coal as measured at the face and the lower at the mouth of the entry. The altitude obtained, 1030, is probably below the actual height.

POUND MILL BRANCH.

On the left, $\frac{1}{2}$ mile up Middle fork: Altitude of mouth, 963.

On the left, $\frac{1}{4}$ mile up the branch, Benjamin Cornett has a long wet entry giving 41 inches of coal 3 yards in, the lower 6 inches in water, and 5 inches of flint fire-clay 32 inches from the top. Argillaceous sandstone covers it. Its altitude is 1110, or possibly somewhat less.

On the left of Middle fork, $\frac{5}{8}$ mile up it, Mr. Cornett has a third wet entry, with 46 inches of coal and 4 inches brown flint fire-clay 35 inches from the top. It is covered by 3 feet of shale, 1 foot of black slate and one more of shale to the sandstone above. Its altitude as obtained is 1110.

On a right branch, $\frac{3}{4}$ mile up Middle fork, on the right, $\frac{1}{4}$ mile up the branch, Mr. Cornett has a fourth entry, long, with 35 inches of top coal, 5 inches of brown flint fire-clay and 7 inches or more of coal under it; the bottom of the bed not reached. Its roof for 10 feet is sandstone and its altitude 1045.

According to altitudes obtained of this bed from the mouth of the Right fork to this point strata lie nearly level and then rise suddenly. It is more likely that the rise is actually nearly uniform and probably not quite so great as indicated.

On a right branch, one mile up Middle fork, $\frac{1}{8}$ mile up it, and $\frac{1}{8}$ mile up its right branch, on each side are wet entries, of Lafayette Cornett's. The one on the right has the following bed-section measured at its mouth:

Rider to Fire-clay Coal.

Sandstone	15 Feet.
Coal	2"
Shale	11"
Coal	3"
Shale	7"
Coal	4"
Shale	2"
Coal	37"
Altitude, 1,110 (?).	

HOLLY THICKET BRANCH.

On the right, $1\frac{1}{2}$ miles up Middle fork: Altitude of mouth, 993.

On the right of the branch, $\frac{1}{8}$ mile up it, Rand Cornett has two abandoned entries with apparently $1\frac{1}{2}$ to 2 feet of coal, possibly more, under 2 feet of slate and shale. Three inches of coal separates the shale from the sandstone cliff above. This is of the Fire-clay coal bed at altitude 1045.

On a left branch, $\frac{3}{8}$ mile up Holly Thicket on the right at the mouth of the branch, Walter Hall has two entries, partly closed, with bed-section at the mouth of one of them as given following.

On the left, $\frac{3}{4}$ mile up Holly Thicket, John Asher has an entry into the same bed with section approximately as follows:

Hall.	Asher.
Shaly sandstone	Shale 4 Feet.
Shale 10 Feet.	Coal 4"
Coal 2"	Shale 8"
Shale 11"	Coal 16"
Coal 31" or more.	Altitude, 1,300.
Altitude, 1,395.	

At each place the shale, brown at the top, changes gradually to black at the bottom. The coal is probably of the Hazard bed.

On the left of Middle fork, $1\frac{7}{8}$ miles up, an unfinished prospect into the Fire-clay coal bed gives, under earth cover, 38 inches of coal and 6 inches flint fire-clay parting 27 inches from the top. It is quite possible that

complete opening would develop 6 to 12 inches more coal. Its altitude is 1055.

LICK BRANCH.

On the right, $2\frac{1}{4}$ miles up Middle fork: Altitude of mouth, 1055.

On the left, at the mouth of the branch, Robert Brashear has a 10-yard entry with section and analysis by the State Survey of my sample of coal above the fire-clay parting as given below:

Fire-clay Coal.

Shale and sandstone..	15	Feet.
Coal	28"	
Bone coal	2"	
Coal	10"	
Flint fire-clay	6"	
Coal (reported) . . .	16"	
Altitude, 1,115.		

Analysis. (Upper Bench.)

Moisture	1.61
Volatile combustible matter..	37.69
Fixed carbon	53.50
Light brown ash	7.20
	100.00
Sulphur . . . . .	.67
Coke	60.70
B. T. U.	14,298

The bone coal appears to have increased the percentage of ash but little and is not likely to be continuous. The rest of the upper seam is a fine-looking, bright, soft coal, with irregular fracture.

On the left, $4\frac{1}{4}$ miles up Middle fork, Manuel Brashear has a long entry blocked by a fall of roof 15 yards in where the bed-section following was obtained:

Hazard Bed.

Shale.	
Coal	9"
Shale	10"
Coal	24"+
Altitude, 1,530.	

The lower coal seam was not fully exposed; it probably is about 30 inches thick. An exceptionally bad roof there is due in part to the light covering, it being about 30 feet thick where the line of the entry crosses the ridge. The gap $\frac{1}{4}$ mile north, where the trail from the Middle to Left fork crosses the ridge, is at the same height as the entry, 1530, and the area of the bed here is small. The character of the covering is somewhat indicative of the Hazard coal bed, but nothing determinative of correlation was seen in the vicinity. Assuming strata to lie at a nearly uniform slope from the upper opening of the Fire-clay coal to the Singleton entry on Leatherwood creek that bed would be about 330 feet beneath the Manuel Brashear entry, bearing out the assumption and the conclusion that the latter is of the Hazard bed.

OLD ROCK BRANCH.

On the right, $5\frac{1}{4}$ miles up Middle fork: Altitude of mouth, 1309.

In this branch at its mouth coal has been taken said to be 5 inches thick.

On the left near the head of the branch, $1\frac{3}{4}$ miles up it, and against a head of Trace branch of Cutshin creek, is a narrow prospect cutting said to have shown 9 feet of coal without parting. Some 4 to 5 feet of coal is still exposed, not enough to verify nor contradict the report. The area here is somewhat larger than at the Manuel Brashear entry, but still small. The bed, at altitude 1500, appears to be again the Hazard.

LEFT FORK.

On the right, one mile up Macies creek: Altitude of mouth, 915.

In a drain on the left of this fork, $\frac{1}{4}$ mile up it, the heirs of P. W. Hall have a wet entry into the Fire-clay coal giving at its mouth 36 inches of coal and a flint fire-clay parting of 5 inches, 31 inches from the top. Its altitude is 1045. Nine inches of shale, under sandstone, covers the bed.

This bed probably goes below drainage near the Road fork, 2 miles up from Middle fork, at altitude about 1100.

On the left, $3\frac{1}{2}$ miles up, 10 feet above the stream, 8 inches of coal, under sandstone, shows at altitude 1310. Also thin coal has been taken from the right branch there, $\frac{1}{8}$ mile up it, at about the same height.

The relation of this coal to the coal of the Manuel Brashear entry is so nearly the same as that of the thin coal taken from Old Rock branch of Middle fork, to the thick coal at the head of that branch, that it is regarded as helping to establish the correlation of the two beds. Thin coal may be found almost anywhere in the series of strata, but such similarity of occurrence is given some weight.

So far as was learned no other coal openings on this fork than those given are now open to view. A little prospecting was done in former years, but nothing remains of that work.

NORTH FORK OF KENTUCKY RIVER BETWEEN MACIES AND LEATHERWOOD CREEKS

NORTH FORK OF KENTUCKY RIVER.

MACIES CREEK TO LEATHERWOOD CREEK.

Coals on the left of the river having been examined and reported a year ago,* only those on the right of the river, with one exception, are now reported.

On the right of the river, $2\frac{1}{4}$ miles above Macies creek, Hiram Baker has an 8-yard entry into the Fire-clay coal bed having 30 inches of coal at its face above the flint fire-clay which, at the mouth of the entry, is 5 inches thick. Two inches of coal are reported to be under the fire-clay. In the lower 3 feet of sandstone roof some coal appears. The 30 feet above that is sandstone with some shale. The bed lies 180 feet above the river, at altitude 1070.

On the right of the river, $2\frac{1}{2}$ miles above Macies creek, James Brashear has a 4-yard entry into the same bed, giving 27 inches of coal upon 4 inches of flint fire-clay and 4 inches of coal under the clay. The roof is sandstone and the altitude of the entry 1090.

In a right drain, 3 miles above Macies creek, the same bed has been opened at altitude 1090. Over it is 80 feet of sandstone, part shaly, under coal, slightly slipped. Either a great thickening of sandstone has occurred here or the Fire-clay coal rider has been completely cut out.

On a right branch, $3\frac{1}{2}$ miles above Macies creek, on the left of the branch, $\frac{1}{8}$ mile up it, Joel Brashear has an opening giving 23 inches of coal, under sandstone, at altitude 940, about 160 feet below the Fire-clay coal, probably of the Amburgy bed, or of the upper part of it.

A new opening on the left of the river opposite James Riddle's house, $5\frac{1}{4}$ miles above Macies creek, is given below along with the bed section of Mr. Riddle's closed entry on the right of the river, $5\frac{3}{8}$ miles above

*See Vol. 1, Series 4, Kentucky Geological Survey, pp. 923 and 987.

Macies creek. Both are in the Fire-clay coal bed at altitude 1090.

On Left of River.		On Right of River.	
Shale	1 Foot.	Shale	2 Feet.
Coal	25"	Coal	24"
Flint fire-clay	4"	Flint fire-clay	3"
Coal	6"	Coal	5"
Bone coal	2"	Black slate	4"
Black slate	4"	Coal (?)	10"
Bone coal	2"		
Coal	6"		

Possibly the bone coal of the new opening should be included with the good coal, depending largely upon whether it adheres to the slate or not. Farther entrance into the bed is necessary to determine this, or if it changes to good coal. With a considerable showing of pyrite flakes on top of the coal next under the fire-clay parting the bed does not present an attractive appearance here, but, nevertheless, it is reported that mining is about to be begun upon it. Alongside the railroad and only about 175 feet above it the location is particularly favorable.*

At the entry on the right the bottom coal was not seen and its quality is therefore not known.

DIKE BRANCH.

On the right of the river, 6 miles above Macies creek: Altitude of mouth, 895.

On the left, $\frac{1}{8}$ mile up the branch, William Pratt has a wet entry with the following bed section:

Fire-clay Coal.	
Shale	4 Feet.
Coal	30"
Flint fire-clay	5"
Coal	4"
Black slate.	
(?)	
Altitude, 1,115.	

*For additional information as to the coal on the left of the river from Lots Creek to Bull Creek, see Vol. 1, Series 4, Kentucky Geological Survey.

The total thickness of the bed at the mouth of the entry is 62 inches, making the thickness of the black slate and coal below it (in water) 14 inches.

On a right branch, $6\frac{3}{4}$ miles above Macies creek, on the right, $\frac{1}{4}$ mile up the branch, the following section was obtained from a closed 4-yard entry, showing a remarkable change in the strata overlying the coal from the thick sandstone at openings between this point and Macies creek:

Fire-clay Coal.	
Massive sandstone	6 Feet.
Brown shale	3 Feet.
Coal	1 Foot.
Soft dark shale	1½ Feet.
Coal and soft shale	2 Feet.
Dark brown flinty clay	1½ Feet.
Thin-bedded sandstone (rusty)	1 Foot.
Dark shale with lime and iron kidneys	1 Foot.
Bright yellow clay	1 Foot.
Dark shale with small iron kidneys	1½ Feet.
Hard dark shale	6 to 8"
Brown shale	15"
Coal	34"
Flint fire-clay	5"
Coal	6"
Black slate (?)	17"
Coal	5"
Altitude, 1,115.	

The lower parting has, in outcrop, much the appearance of black coal, but its weight condemns it.

The bright lemon-yellow clay over the coal is found also at one place on Leatherwood creek but is not known to occur elsewhere.

CAMPBELL BRANCH.

On the right of the river, 7 miles above Macies creek, giving the short road to that stream and to Hazard: Altitude of mouth, 900.

On the right, $\frac{1}{4}$ mile up the branch, John B. Pratt has an entry, now closed, giving the following section:

Fire-clay Coal.

Sandstone	2	Feet.
Shale	1	Foot.
Sandstone	2	Feet.
Shale	4	Feet.
Coal	28"	
Flint fire-clay	5"	
Coal (?)	19"	

It is probable that the bottom 19 inches includes some black slate which could not be distinguished from coal at the time of measurement. This opening being not over $\frac{1}{2}$ mile from the one next preceding, the change in covering is especially to be noted.

BRIER BRANCH.

On the right of the river, $7\frac{1}{2}$ miles above Macies creek, 1 mile below Leatherwood creek: Altitude of mouth, 900.

On the right, $\frac{1}{4}$ mile up the branch, the Fire-clay coal is opened in a 5-yard wet entry, at the mouth of which the following section was taken. The coal covering here, including the lemon-yellow clay, is very like that on the branch below Campbell branch, while the covering of the Campbell's branch coal differs, although about midway between them.

Fire-clay Coal.

Brown shale	3	Feet.
Massive sandstone	2	Feet.
Brown shale	2	Feet.
Brown shale with iron kidneys	1	Foot.
Dark shale	1	Foot.
Bright yellow clay	$\frac{1}{2}$	Foot.
Brown shale	$4\frac{1}{2}$	Feet.
Coal	26"	
Flint fire-clay	4"	
Coal	7"	
Black slate	6"	
Coal reported about	12"	
Altitude, 1,100.		

On the left, $\frac{1}{2}$ mile up the branch and 10 feet above it, is the following, probably including one or all of the

coals in the covering of the main bed on the branch below Campbell branch:

Rider to Fire-clay Coal.

Shale	5	Feet.
Coal	6"	
Shale	10"	
Coal	10"	
Shale	$1\frac{1}{2}$	Feet.
Shaly sandstone	8	Feet.
Altitude, 1,140.		

Coal is exposed in the left fork of the branch, $\frac{1}{4}$ mile up it and 1 mile from the river, and from the coal and an adjacent prospecting cut on the left the following section was obtained:

Haddix Bed.

Shale	3	Feet.
Coal	5"	
Shale	9"	
Coal	22"	
Black slate	1	Foot.
Sandstone		
Altitude, 1,300.		

The interval from the Fire-clay coal to this one seems to prove the latter as of the Haddix bed, but it is not impossible that it may yet be found, slightly higher, directly under the next sandstone. The general pitch of strata is in favor of this view.

LEATHERWOOD CREEK

LEATHERWOOD CREEK.

The following section was obtained from the railroad cut opposite the mouth of this creek:

Shale	15	Feet.
Coal	1	Foot.
Shale	15	Feet.
Coal	1	Foot.
Sandstone	15	Feet.
Railroad.		
Covered	30	Feet.
River.		
Altitude, 905.		

The two coal seams probably represent the Amburgy bed, one of which, presumably the upper one, shows at several points along the road up the creek from its mouth to opposite the mouth of Little Leatherwood, under a sandstone cliff, in place of the shale found at the railroad. It is reported, however, that there is a 4-foot bed of coal in the river, and, if this is true, then it must be of the Amburgy bed.

LITTLE LEATHERWOOD CREEK.

On the left, $\frac{1}{2}$ mile up Leatherwood: Altitude of mouth, 915.

On the left, $1\frac{1}{2}$ miles up the creek, 10 feet above it, this same upper seam, apparently, is still about one foot thick and under 20 feet of massive sandstone forming a low rock house at altitude 1020.

At James Riddle's, $1\frac{3}{4}$ miles up the creek, a thin coal shows on a small bench on the right, at altitude 1175, and above it, is an entry into a coal bed $2\frac{1}{2}$ feet (or more) thick, the bottom foot hidden in water. Over it is $1\frac{1}{2}$ feet of black shale with small concretions and then 2 feet more of the shale without concretions. This bed is the Fire-clay coal rider at altitude 1270.

BENT BRANCH.

On the left, 2 miles up the creek: Altitude of mouth, 1048.

In the branch, $\frac{1}{8}$ mile up it, a thin coal shows on sandstone at altitude 1065.

On the right of the branch, $\frac{1}{4}$ mile up it, F. A. Griffee has a 4-yard entry into a coal bed 3 feet thick, containing about 2 feet of coal with three partings, the lower one, of 6 inches, being rash coal. This appears to be of the Fire-clay coal bed at altitude 1215. It is covered by about 6 inches of black slate and then two feet of shale exposed.

On the left of the creek, $2\frac{1}{4}$ miles up Little Leatherwood, Lindsey Holcomb has an entry, fallen in, said to have 28 inches of coal, under sandstone, and with flint fire-clay floor. It is but about $\frac{1}{4}$ mile from the Griffee entry and nearly certainly of the same Fire-clay coal bed—with altitude 1225.

Coal 1 to $1\frac{1}{2}$ feet thick is reported 25 feet higher—the coal of the Riddle entry (with allowance made for barometric inaccuracy rather than for a southeast dip of 20 feet on crossing the valley).

TWIN BRANCH.

On the right, $2\frac{1}{2}$ miles up the creek: Altitude of mouth, 1060.

On the left, $\frac{1}{2}$ mile up the branch, the former Pratt entry still shows coal upon flint fire-clay at altitude 1265.

FENDER CREEK.

On the left, 4 miles up Little Leatherwood: Altitude of mouth, 1128.

A section taken for the Survey in 1884 gives the following coals found in the vicinity of the mouth of the creek with altitudes corrected to conform to recent levels:

Haddix Coal.	Coal stain	Altitude, 1,485.
	Interval.	
	Shale.	

Rider (?)	Coal	9" Altitude, 1,365.
	Interval.	
	Sandstone	
	Black slate	12"
	Shale	1"
Fire-clay Coal.	Coal	26" Altitude, 1,305.
	Interval.	
	Shale.	
	Coal	6"
	Shale	3"
Whitesburg Coal.	Coal	2"
	Shale	5"
	Coal	17" Altitude, 1,240.

The Haddix bed may prove workable, but, in this immediate vicinity, the hills appear not high enough to give much area. Back from the main creek, that and the Hazard bed may both be found of workable thickness and area.

On the right, 1 mile up Fender creek, Moses Isom has a 10-yard entry into the Fire-clay coal, 32 inches thick at the face. Its floor is argillaceous sandstone and upon it is 8 feet of shale. Its altitude is 1355.

Opposite this last entry Mr. Isom has another, now closed, beside the road, giving the following section at its mouth:

Fire-clay Coal.

Shale	5 Feet.
Coal	48"
Sandstone	6 Feet.
Thin Coal	
Clay	
	Altitude, 1,355.

This 48 inches includes possibly a 1-inch parting 1 inch from the bottom.

On a right branch, $4\frac{1}{8}$ miles up Little Leatherwood, on the right, $\frac{1}{4}$ mile up the branch, Marian Holcomb has a 6-yard entry into the Whitesburg bed, measured at its face, and opposite, on the left, a 3-yard closed entry into the Fire-clay coal bed. These are given below:

Whitesburg Bed.		Fire-clay Coal Bed.	
Shale	5 Feet.	Shale	2 Feet.
Coal	6"	Coal (reported) ..	.26"
Shale	1"	Altitude, 1,310.	
Coal	5"		
Shale	1"		
Coal	18"		
Altitude, 1,260.			

On the next right branch, $4\frac{1}{4}$ miles up Little Leatherwood, on the left, $\frac{1}{2}$ mile up the branch, Harvey Holcomb has a 1-yard entry into the Fire-clay coal, about 28 inches thick, the lowest 6 inches not seen, under 8 feet of shale. Its altitude is 1330.

On the next right branch, $4\frac{3}{8}$ miles up Little Leatherwood, on the right, $\frac{1}{4}$ mile up the branch, William Hall has an open cut into the Fire-clay coal bed, giving, under soft clay covering and on a flint fire-clay floor, coal varying from 24 to 28 inches in thickness, at altitude 1360.

Opposite, on the left of the branch, he has an entry into the same bed.

NAT BRANCH.

On the right, $4\frac{1}{2}$ miles up Little Leatherwood: Altitude of mouth, 1145.

At the head of the branch, $\frac{3}{8}$ mile up it, and about the same distance south of the gap with trail to Beehive Branch, Mrs. Shepard has a wet entry, giving, under 5 feet of shale, 43 inches of coal, including 8 inches in water and not seen, at altitude 1740. This is 180 feet above the gap with trail and only about 100 feet below the summit where it is located, and it has, therefore, very little area on this branch.

Allowing for a slight rise of strata from the nearest Fire-clay coal openings on Little Leatherwood and on Owen branch brings this coal into the horizon of the Francis bed (a bed not known to be workable south of Carr fork), but it is more likely that a greater rise occurs, in which case this is the Flag bed, or, possibly, even the Hazard. The thickness of the coal is rather indicative of the latter.

Thin coal on the left of Little Leatherwood at the mouth of Seng branch, $5\frac{3}{4}$ miles up the creek, 15 feet

above it, is about on the level of, probably a little above, the Amburgy bed.

Another thin coal, probably of the Whitesburg bed, has been taken from the creek, $6\frac{3}{4}$ miles up it, in front of the Joseph Holcomb house, at altitude 1380. Ten feet of shale overlie and 15 feet underlie the coal, as shown in the creek bank below the pit from which the coal was taken.

In the creek at its head, 7 miles up it, on the right of the trail to the head of Big Leatherwood, Mr. Holcomb has a 5-yard entry into the Fire-clay coal, giving at its mouth 29 inches of coal under 20 feet of sandstone. The coal has the usual excellent appearance of this bed, except that 3 or 4 inches, 9 inches from the bottom, is somewhat slaty. The altitude obtained is 1495.

Coal is reported at a spring on the ridge to the right of the entry at altitude 1670, evidently of the Had-dix bed. The interval from this down to the Fire-clay coal, 175 feet, is rather small, and from that to the bed below, 115 feet, too large for the Whitesburg bed. It is probable that the actual altitude of the Fire-clay coal at the entry is about 1450 or 1460, instead of 1495 as obtained.

Coal has been opened, but apparently it is thin, above the spring, at altitude 1720, the Hazard coal. The hill-top here is but little over 100 feet high, but a considerable area of this coal lies in the vicinity.

HICKS BRANCH.

On the right $1\frac{1}{4}$ miles up Leatherwood creek: Altitude of mouth, 944.

On the left, $\frac{1}{8}$ mile up this branch, Manning Cornett has a closed entry into the Fire-clay coal, with covering similar to those on either side of Campbell branch. The full section obtained at the mouth of the entry is:

Fire-clay Coal.

Thin-bedded sandstone.	
Dark shale	5 Feet.
Dark shale with concretions ..	1½ Feet.
Black slate ..	10"
Brown clay	8"

Coal	20"
Flint fire-clay	4"
Shale	3"
Coal	5"
Shale	4"
Coal	13"

Altitude, 1,185.

The roof of this entry is extremely bad.

RIGHT FORK.

On the right, $\frac{1}{4}$ mile up Hicks branch: Altitude of mouth, 955.

On the right at the mouth of the branch, the Amburgy bed, under 5 feet of shale, gives 20 inches of coal at altitude 965.

On the left $1\frac{1}{4}$ miles up the right fork, and by it, the following section is exposed:

Fire-clay Coal.

Sandstone.	
Shale	10 Feet.
Black shale with calcareous concretions.	10 Feet.
Coal	6"

Altitude, 1,120.

The concretions over the coal determine this as of the Fire-clay coal bed, but it is probable that more coal lies under the 6 inches in the stream.

On the right, $1\frac{1}{4}$ miles up the fork, an opening has been made into the Fire-clay coal rider, under shale and apparently thin, at altitude 1150.

LEFT FORK.

On the left, $\frac{1}{4}$ mile up Hicks branch: Altitude of mouth, 955.

In this fork a thin coal shows under black slate at altitude 1005. Though rising quite rapidly here, it appears to be too low for the Whitesburg bed.

On the right, $\frac{7}{8}$ mile up the fork, a prospect into the Fire-clay coal bed gives the following section, the

correlation determined by the strata exposed over the coal, duplicating that over the Manning Cornett entry.

Fire-clay Coal.

Thin bedded sandstone.

Dark shale	5 Feet.
Dark shale with concretions	1 Foot.
Black slate	6"
Brown clay	4"
Coal and shale	28"

Altitude, 1,160.

The coal bed consists of 28 inches of coal and 4 or 5 partings, the bottom 6 inches hidden in water.

On the left, 1 mile up the fork, and on the left of the road, a wet entry gives, at its mouth, the following:

Fire-clay Coal.

Sandstone	5 Feet.
Shale	3½ Feet.
Coal	½"
Shale	1½ Feet.
Coal	36"

Flint fire-clay

Altitude, 1,205.

The bottom 6 inches of the coal was covered and not seen.

On the left of the fork at its head, $1\frac{3}{4}$ miles up, the Riverside Coal Company has a wet entry giving the section following:

Haddix Coal.

Sandstone	6 Feet.
Cannel slate	8 to 10"
Shale	5"
Coal	41"

Altitude, 1,505.

The bottom foot was in water and not seen. The bench of the Hazard coal lies about 50 feet higher.

On the right of Leatherwood creek, 2 miles up, between the road and Arch Cornett's house, the upper

one of the two thin coals at the mouth of the creek shows under 15 feet of sandstone. It is 14 inches thick and its altitude is 1020.

DEEP HOLE BRANCH.

On the left, $2\frac{1}{4}$ miles up Leatherwood: Altitude of mouth, 965.

On the left, $\frac{1}{4}$ mile up, coal 10 inches thick under 20 feet of sandstone, with 2 feet of black slate between them, lies at altitude 1020.

Coal taken from the branch, $\frac{3}{4}$ mile up it, under 10 feet of shale, probably the same bed as the two next preceding, lies at altitude 1065.

From the forks, $\frac{3}{4}$ mile up the branch, on the left, $\frac{1}{2}$ mile up the right fork is Arch Cornett's wet entry with the section following:

Fire-clay Coal.

Sandstone	8	Feet.
Shale	$1\frac{1}{2}$	Feet.
Coal	5"	
Clay	5	Feet.
Coal (about)	27"	
Altitude, 1,295.		

Water in the entry prevented accurate measurement. In this opening the covering similar to that of the Fire-clay coal opening farther up Left fork of Hicks branch, gives the correlation.

At the mouth of a right branch $2\frac{3}{4}$ miles up Leatherwood, the same bed as that exposed along the creek below has 10 inches of coal at altitude 995, under sandstone.

PUNCHEON CAMP BRANCH.

On the right, $3\frac{3}{4}$ miles up Leatherwood: Altitude of mouth, 990.

On the right of the branch at its mouth, the same small bed appears again, under 6 feet of sandstone, with 16 inches of coal and 2 inches of shale one inch below the top, at altitude 1010.

From the forks, $\frac{1}{2}$ mile up the branch, on the left, $\frac{1}{8}$ mile up the left fork, Mrs. Ison has an entry into a

coal bed 3 feet thick, two-thirds covered with water and under 15 feet of shale. Its altitude, 1250, seems to be too high for the Fire-clay coal, but right for its rider.

At Henry Singleton's, $4\frac{1}{4}$ miles up Leatherwood, on the right, $\frac{1}{8}$ mile up a right branch, an old entry still in use, gives 80 yards in, the following section:

Fire-clay Coal.

Shale.	
Coal	7"
Bituminous shale	5"
Coal	31"
Flint fire-clay	5"
Altitude, 1,245.	

There is no coal below the dark flint fire-clay floor. The parting near the top is soft and can be made available as a mining seam. The roof is fairly good.

BEE-HIVE BRANCH.

On the left, $4\frac{1}{4}$ miles up Leatherwood. Altitude of mouth, 1005.

An old opening into the Amburgy bed, probably, on the left $\frac{1}{2}$ mile up the branch, at altitude 1065, gave thin coal directly upon sandstone. On the left, $\frac{3}{4}$ mile up the branch, the same bed, at altitude 1090 shows 30 feet of shale above it; the lower third of the exposure carries small lime concretions. On the right, $\frac{7}{8}$ miles up the branch, at its level and opposite the mouth of a left branch, the coal is exposed 16 inches thick, at altitude 1095.

One-eighth mile up that left branch, on the right $\frac{1}{2}$ mile up its left branch, an 8-yard wet entry into the Fire-clay coal, has about 2 feet of coal under 3 feet of shaly sandstone and is at altitude 1330.

On the right, 2 miles up Bee-Hive branch, on the way to Beech Rock branch, the Kentucky Union Land Co. has a 10-yard entry into the Fire-clay coal giving at its face 27 inches of coal and a black slate parting 6 inches thick, almost an impure coal, one inch from the bottom. The bed here has sandstone floor and roof and is at altitude 1390.

The same bed is opened on the left, $2\frac{1}{4}$ miles up the branch, with coal reported $2\frac{1}{2}$ to 3 feet thick.

It is also reported that the Fire-clay coal has been opened in several other places farther down the branch, but always with less than $2\frac{1}{2}$ feet of coal.

On the right, at the forks $2\frac{3}{4}$ miles up the branch, the Haddix coal has been opened, but is now covered, at altitude 1655.

Directly above this is a 15-yard wet entry of the Kentucky Union Land Company's, which, not under good cover, gave the following bed-section 3 yards in:

Hazard Bed.

Shale	.....	3 Feet.
Coal	.....	34"
Shale	.....	3"
Coal	.....	3"
Altitude, 1,710.		

The Haddix bed has another opening in the point of the hill between the forks at this same place, now nearly covered, but showing a bed too thin to work.

OWENS BRANCH.

On the right, 5 miles up Leatherwood: Altitude of mouth, 1015.

On the right, $\frac{1}{4}$ mile up a left branch, $\frac{3}{4}$ mile up Owens Branch, Jack Callahan has a long entry into the Fire-clay coal. Beneath shale roof, it has 42 inches of coal and a 1-inch shale parting, 7 inches from the top, as measured 3 yards in. The bottom half of the bed, in water, was not seen. Its altitude is 1255.

RIGHT FORK.

On the right, $\frac{7}{8}$ mile up Owens branch: Altitude of mouth, 1140.

On the right at the mouth of a right branch, $\frac{1}{4}$ mile up this fork, T. G. Campbell has a 10-yard entry into the Fire-clay coal, which, under 5 feet of shale, is at the face, 35 inches thick, including 1 inch of shale parting 7 inches from the top. The coal is all moderately

soft, the bottom 3 inches said to be particularly good for blacksmithing. Its altitude is 1275.

On the right at the head of the fork, $1\frac{1}{4}$ miles up it, beside the path to Macies creek, is a 5-yard wet entry into a coal bed about $4\frac{1}{2}$ feet thick with, apparently, a parting of 2 inches about 5 inches from the top. The lower 6 inches was not seen. Over the bed is $1\frac{1}{2}$ feet of shale and then massive sandstone. Its altitude is 1620. This is 115 feet higher than the opening on the head of Hicks branch, and, assuming what is probably the case, that strata lie nearly level between the two, this is of the Flag bed.

LEFT FORK.

On the left $\frac{7}{8}$ mile up Owens branch: Altitude of mouth, 1140.

On the left $\frac{7}{8}$ mile up Owens branch: Altitude of has a wet entry into the Fire-clay coal, giving about 34 inches of coal, with one inch of clay parting 24 inches from the bottom, and shale roof. Its altitude is 1255.

A thin coal under 10 feet of sandstone $\frac{3}{4}$ mile up this fork and at its level, at altitude 1270, probably represents the rider to the Fire-clay coal.

On the left at the head of the fork, one mile up it, an opening has been made into a coal bed reported 9 feet thick including a thick parting. It lies at altitude 1575, but is now so covered that neither coal nor roof is visible. It is not much more than a mile from the reported thick coal of right fork of Macies creek, and is of the Hazard bed.

On the right of Leatherwood, $5\frac{7}{8}$ miles up the creek, John M. Gilliam has a 12-yard entry into 33 inches of coal measured 4 yards in, at altitude 1230. Two inches of coal in the middle of the bed are slightly slaty, but the rest is fine looking, rather soft. The floor is shale and 5 feet of massive sandstone lies on the coal. The bed is close to the level of the Fire-clay coal and probably is it, notwithstanding its different section at the first opening up Beech fork.

BEECH FORK.

On the right of Leatherwood, 6 miles up the creek: Altitude of mouth, 1040.

On the right, $\frac{3}{4}$ mile up this fork is an 8-yard entry, which, measured half way in, gives the following bed-section:

Fire-clay Coal.

Shale	10	Feet.
Coal	2 to 4"	
Black shale	24"	
Coal	8"	
Shale	1"	
Coal	5"	
Shale	17"	
Coal	12"	
Flint fire-clay.		
Altitude, 1,220.		

In a left branch $1\frac{1}{4}$ miles up Beech fork, and $\frac{1}{4}$ mile up the branch, 20 to 24 inches of coal shows at altitude 1205. This is of the Fire-clay coal bed, having here sandstone close below it and above it, mostly, to a bench some 50 feet higher.

On the right of a left branch at its mouth, $1\frac{3}{4}$ miles up Beech fork, the Fire-clay coal is again under 5 feet of shale, and has 39 inches or more of coal and a shale parting of 6 inches, 12 inches from the top. The bottom 6 inches was not seen. Its altitude is 1230.

This same bed is opened on the left, $2\frac{1}{2}$ miles up Beech fork, in the Callahan entries, one long and closed, and one 12-yard entry adjoining, from the face of which were taken the measurements following and my sample of the coal, analyzed for the Survey with the following results:

Fire-clay Coal.

Shale and sandstone.	
Coal	7"
Shale	1"
Coal	30"
Altitude, 1,230.	

Analysis.

Moisture	1.80
Volatile combustible matter.....	38.66
Fixed carbon	53.84
Ash (brown)	5.70
	100.00
Sulphur	0.69
Coke	59.54
B. T. U.	14,447

The coal is somewhat soft, excepting an inch of bone, included in the sample, lying on the parting. It has an irregular fracture. A hard clay forms the floor of the entry and is probably a variation of the characteristic parting.

From an earlier investigation the following section was obtained in this vicinity:

	Altitude.
Hill top	1850
Coal stain..... Francis bed (?)	1690
Limestone iron ore	1630
Coal stain..... Hazard bed (?)	1530
Coal..... 11" in sandstone	1330
Coal..... 35" (6 partings 17½ in.).....	1300
Clay, coal and shale..... 18" } under shale	1255
Coal..... 8" }	
Callahan entry coal.....	1230

The four coals of the lower part of the section, because of their proximity and varying sections and coverings, somewhat obscure correlation, but there is little reason to doubt that the lowest one is of the Fire-clay bed. The one 70 feet higher (at 1300) has been considered, in some instances where the interval was 20 or 30 feet less, to be the rider to that bed, but, with the thin intermediate coal to answer for the rider, the higher coal may well be considered a distinct bed, though nowhere excepting on Clover fork, so far as known, in workable condition at such height above the Fire-clay coal.

No openings appear to have been made on the high coals of Beech fork, and one may only conjecture that the coal stains found in that section are of the Hazard

and Hindman beds. From surrounding openings on other streams there may be expected here two other workable beds in the high hill examined.

Other exposures on this stream serve merely to give the dip of strata, which fall rather rapidly from Bee-hive branch westward to the mouth of Beech fork, then flatten out and reverse to a slight eastward dip a mile or two up the fork.

On the left, $2\frac{3}{4}$ miles up Beech fork, a thin coal, the Fire-clay coal rider, shows under 5 feet of shale at altitude 1280, 25 feet above the creek, where the main bed probably lies.

LEFT FORK.

On the left, 3 miles up Beech fork: Altitude of mouth, 1300.

On the left, $\frac{1}{4}$ mile up this fork, the same thin coal shows again under 10 feet of shale at altitude 1320.

On the left, $\frac{1}{2}$ mile up the fork, the coal of many partings at altitude 1300 of the preceding section is apparently only 8 inches thick, under 5 feet of shale and then sandstone, at altitude 1360.

On the right, $6\frac{3}{4}$ miles up Leatherwood creek, the following section has been opened:

	Altitude.
Shale	5 Feet.
Coal (with 1 in. parting)	17" .. 1280
Sandstone	
Shale	
Coal (with 0 to 2 in. parting)	17" (Fire-clay coal) 1265

The lower coal seam might be supposed a slip from the upper, but that the solid rock is exposed between the two. The upper one may be a part of the Fire-clay coal bed or its rider. Its parting is shale while that of the lower seam is sandstone.

On the left of Leatherwood, 7 miles up it, an old prospect gives the Fire-clay coal bed, $3\frac{1}{2}$ to 4 feet thick with no parting apparent, under 5 feet of shale, at altitude 1280.

GRAVE BRANCH.

On the left, $7\frac{1}{4}$ miles up Leatherwood: Altitude of mouth, 1080.

On the left, $\frac{1}{8}$ mile up the branch, is exposed in a cliff the section following:

Sandstone	10 Feet.
Coal	12" Altitude, 1,165.
Fire-clay	
Sandstone	5 Feet.
Coal	6"
Sandstone	

On the right, $\frac{1}{4}$ mile up the branch, a prospect cut, hardly complete, gives the following:

Whitesburg Coal.

Shale	5 Feet.
Coal	24"
Shale (1 in. coal)	6"
Coal	21"
Altitude, 1235.	

Above this last opening a former visit gave the following—former John Couch opening:

Hazard Bed.

Shale.	
Coal	60"
Clay	12"
Shale	6"
Coal	12"
Altitude, 1565.	

The thickness and parting here are strongly indicative of the Hazard bed, and assuming the Fire-clay coal to be at altitude 1310, conformity with the usual intervals from it to the Whitesburg and Hazard beds is nearly obtained. The interval to the upper bed corresponds more nearly to that of the Flag coal, but the bed-section is that of the Hazard. The excess in interval is perhaps due to barometric inaccuracy. From the Fire-clay coal opening next below the branch to this one a slight rise

in continuation of that farther down the creek results, and the interval to the Amburgy bed opened on Clover fork is also in agreement. Here is the best opportunity for getting intervals between coals which the present development on the creek affords.

CLOVER FORK.

On the right, $7\frac{1}{4}$ miles up Leatherwood creek: Altitude of mouth, 1085.

On the left, $\frac{1}{8}$ mile up this fork, William G. Cornett has a 5-yard wet entry with the following sections:

Amburgy Coal.

Shaly sandstone	5	Feet.
Coal (with parting)	9"	
Shaly sandstone	10	Feet.
Shale	5	Feet.
Coal	3 to $3\frac{1}{2}$	Feet.
Altitude, 1095.		

The main coal showed no parting and probably exceeds 3 feet very little.

On the left, 50 yards beyond the entry and 50 feet higher, altitude 1145, is 11 inches of coal beneath 10 feet of shaly sandstone. This corresponds to one of the seams of coal found on the left of Grave branch, showing the Amburgy bed to be there at about altitude 1115.

On the left, $\frac{1}{4}$ mile up the fork, the Fire-clay coal has been opened 28 inches thick, under 5 feet of shale, and then sandstone at altitude 1285.

In the next left drain, 100 yards farther up the fork, 32 inches of coal, partly splint, under 3 feet of sandstone, is opened at altitude 1390. This appears to correspond to the 11 inches of coal found 100 feet above the Fire-clay coal on Beech fork; of a bed nameless because of its usual insignificance. It looks well here, however.

RIGHT FORK.

On the right, $\frac{5}{8}$ mile up Clover fork: Altitude of mouth, 1140.

At the mouth of Stone Coal branch, $\frac{1}{2}$ mile up this fork, coal is taken from the creek and from the branch,

exposing a considerable length of outcrop from which the following measurements were obtained:

Fire-clay Coal.

Sandstone.	
Coal	24"
Flint fire-clay	4 to 6"
Shale	6"
Sandstone.	
Altitude, 1215 to 1220.	

The bed rises quite sharply here up stream against the prevailing pitch, which, from the mouth of Clover fork to this point, amounts to nearly 100 feet.

Pebbles in quantity have been found $1\frac{1}{4}$ miles up in the Right fork, which seemed to have come from a soft sandstone at altitude 1475. They are not known to occur elsewhere in this region.

On the left of a left branch, $1\frac{1}{2}$ miles up the right fork, $\frac{1}{8}$ mile up the branch, coal has been opened to a reported thickness of 3 feet at altitude 1565. It lies upon a small cliff and is of the Hazard bed or close beneath it.

On the left of a right branch at its mouth, 2 miles up the right fork, $\frac{1}{4}$ mile from the divide at the head of Laurel branch of Cutshin creek, a prospecting cut, now nearly covered, formerly gave the following:

Hazard Coal.

Shale	8	Feet.
Coal	54"	
Thin parting.		
Coal	12"	
Altitude, 1565.		

Across the divide, on Laurel branch, an opening that is probably of this bed has coal 66 inches thick, 23 inches of which is cannel.

CLOVER FORK ABOVE RIGHT FORK.

Coal has been taken from this fork, $\frac{1}{2}$ mile above mouth of Right fork, reported 2 feet or more thick, at altitude 1205.

On the left, and right of path, $1\frac{5}{8}$ miles up Clover fork, an incomplete opening gives, under earth covering, 31 inches of coal, partly splint, at altitude 1330. This must be of the Fire-clay coal bed, notwithstanding its resemblance to the opening at altitude 1390, $\frac{1}{4}$ mile up Clover fork. The rider and the Hazard beds are found near by, the lower bench of the latter 245 feet above the 31-inch coal.

On the left, $1\frac{3}{4}$ miles up Clover fork, the following section, representing the Fire-clay coal rider, is exposed:

Shale	.....	10	Feet.
Coal	.....	3"	
Shale	.....	4"	
Coal	.....	1"	
Shale	.....	3	Feet.
Coal	.....	8"	
Altitude, 1350.			

On the left, $1\frac{7}{8}$ miles up Clover fork, on the right of Indian Grave branch at its mouth, 2 feet of coal is exposed on a cliff-rock at altitude 1575. Ten feet above this exposure is an old opening with coal now covered, but workable thickness is indicated. This is not over 275 feet above the Fire-clay coal and is of the Hazard bed.

On the right of Lick branch at its mouth, $3\frac{1}{8}$ miles up Clover fork, on land of the Kentucky Union Land Company, the following section is opened:

Hazard Coal.

Shale	.....	3	Feet.
Coal	.....	50"	
Covered	.....	10	Feet.
Coal	.....	2 to 2½	Feet.
Altitude, 1640.			

On the left, $7\frac{7}{8}$ miles up Leatherwood creek, 5 feet above it, coal has been opened in several entries giving about 36 inches of coal, one entry only showing a parting hardly an inch thick. These are in the Amburgy bed at altitude 1110. The down stream dip in evidence there is sufficiently rapid to carry the bed below the creek before reaching Clover fork, but the opening into the bed on that fork and evidence on Grave branch prove

the rapid dip to be of short continuance. Farther up Leatherwood the bed must go below the creek very quickly.

LYNN BRANCH.

On the right, $8\frac{1}{8}$ miles up Leatherwood: Altitude of mouth, 1115.

One-half mile up this branch it forks.

On the right, at the mouth of a left branch, $11\frac{1}{2}$ miles up the Right fork, a prospect into the Hazard bed gave 51 inches of coal (8 inches in water, not seen) with earth covering. About 4 inches of this is splint coal and the rest good block. Its altitude is 1545. The ridge between this fork and the left fork is over 200 feet higher, giving abundant area.

The left fork divided into two forks $11\frac{1}{4}$ miles up it. On the right at the mouth of a left branch, $\frac{1}{2}$ mile up the second left fork, the following has been opened:

Hazard Coal.

Shaly sandstone	.....	4	Feet.
Shale	.....	4	Feet.
Coal	.....	44"	
Slaty coal	.....	8"	
Coal	.....	8"	
Altitude, 1615.			

The lower 7 inches, in water, was not seen. The slaty coal is not very bad, but that with three thin streaks of bone coal, apparently not continuous, may mar considerably the quality of the coal. These two openings and most of the land on the two forks belong to the Kentucky Union Land Company.

OLDHOUSE BRANCH.

On the right, $8\frac{3}{4}$ miles up Leatherwood: Altitude of mouth, 1155.

On the right of a small right branch at its mouth, $\frac{1}{2}$ mile up Oldhouse, on J. B. C. Cornett land, the top of an old opening showed:

Fire-clay Coal Rider.

Shale and clay	10 Feet.
Coal	14"
Shale	10"
Coal	5"
Shale	2 Feet.
Altitude, 1280.	

Some 4 to 6 feet of the opening below was covered, but in a private report to the Tennis Coal Company there is stated to be there 46 inches of fine bright coal (more or less of it soft coking coal). The thickness given is without doubt accurate, and the bed the Fire-clay coal, with its rider still visible above it.

On the left of the right fork of Oldhouse branch, a mile from Leatherwood, an old entry with the bottom coal formerly covered still had visible 3 to 3½ feet of coal with shaly sandstone roof. This, at altitude 1625, is probably of the Hazard bed, the height above the Fire-clay coal down the branch being increased by an up-stream rise of strata.

On the left of the left fork, 1½ miles from Leatherwood, William Shepard had a small entry into the same bed with section, and analysis by Dr. Peter, of my outcrop sample of the best of the coal following:

Hazard (?) Coal.

Sandstone.	
Coal	62"
Shale	1"
Coal	2"
Shale	1"
Coal	2"
Shale	2"
Coal	4"

Analysis.

Moisture	1.40
Volatile combustible matter	28.60
Fixed carbon	58.00
Ash (very light gray)	12.00
<hr/>	
Sulphur	100.00
Specific gravity	0.958
Coke	1.362
<hr/>	
Dense	

"A weathered sample of what appear to be bituminous and splint coals, which seem to be pretty pure."

The sample was taken from the lower 45 inches of the 62-inch seam, the upper 17 inches being too unsound for sampling at the time the sample was taken. The report, just quoted, to the Tennis Coal Company states that at no time in mining was more than 46 inches of coal used, the alternate coal and shale at the bottom providing a mining seam. The 46 inches of solid coal underground, which may be considered the true thickness, is a fine, bright coal, partly splint, which is evidently much purer than the high ash of the analysis gives for the outcrop coal.

The succession of openings near the heads of Lynn and Oldhouse branches give the impression of their being in one coal bed, which is probably correct, the change of the Oldhouse openings to sandstone roof conforming to that condition of the Hazard bed farther up the creek, but each of these Oldhouse openings is 20 to 30 feet below a prominent bench, a condition not usual with the Hazard bed, throwing doubt on the correlation.

STONY FORK.

On the right, 9 miles up Leatherwood creek: Altitude of mouth, 1165.

On the left, ¼ mile up the fork, there is exposed in a cliff at water level, 9 inches of coal with 3 inches of black slate parting in the middle, at altitude 1190, under 5 feet of shale and then 20 feet of sandstone.

BAKER (FORMER SMITH) BRANCH.

On the right, ⅝ mile up Stony fork: Altitude of mouth, 1255.

In a left drain, 1 mile up this branch, the Flag bed has been opened with 42 inches of splint coal without parting, a sandstone roof and altitude of 1705.

On the right, ¾ mile up Stony fork, 20 feet above it, are the Friley Browning openings into the Fire-clay coal. In the 20 yards exposure, partly mined under roof, there is little variation in the upper coal seams and partings, but the bottom seam of coal varies from 30 to 41 inches

in thickness, and in character from splint and block coal to the same and slickenseit.

Following is the bed-section as measured at two places, and analysis of my sample of the bottom bench of this coal and of a specimen of the slickenseit, as determined by Dr. Peter:

Fire-clay Coal.

Shale	14	Feet.
Coal	7"	6"
Shale	1"	2"
Coal	6"	6"
Shale	4"	6"
Coal	5"	5"
Shale	3"	5"
Coal	41"	30"

Altitude, 1285.

Analyses.

	Lower Bench.	Slickenseit.
Moisture	1.40	1.44
Volatile combustible matter	28.20	38.06
Fixed carbon	53.90	54.90
Ash	16.50	5.60
	100.00	100.00
Sulphur	0.978	0.972
Specific gravity	1.799	1.276
Coke	Dense	Dense
Ash	Very light gray.	Nearly white.

Lower Bench.—Though taken from a muddy outcrop, Dr. Peter reports of this coal: "A pretty pure-looking sample. Breaking into thin irregular laminac, with some fibrous coal apparent, but no pyrites visible. The excessive ash cannot all be attributed to adhering mud, nor does a late view of the bed indicate a poor coal."

Slickenseit.—"Pitch-black, pure-looking coal. Fracture irregular. No fibrous coal or pyrite apparent."

What is perhaps the splint coal bed of Clover fork, there 105 feet above the Fire-clay coal, has been opened 165 feet above the Browning entries with section as follows:

Sandstone.	
Cannel coal	9"
Shale and ore	13"
Cannel coal	7"
Clay	7"
Coal	12"
Black slate	3"
Altitude, 1450.	

It is rather more likely that this is of the Haddix bed, with interval to the Fire-clay coal actually somewhat greater than the difference in height of the two openings indicates.

On the left, 2 miles up Stony fork, on the road to Line fork, behind James Morgan's house, the Hazard bed is opened in a 9-yard entry with about 50 inches of coal, the lower 9 inches in water when visited, at altitude 1685. Splint and block coal were found there, some with irregular cleavage.

Along the creek for a quarter-mile above the Browning openings strata lie nearly level, but above the forks of Stony fork, on the road to Line fork, cliffs show a marked up-stream rise. The Haddix coal lies probably between the two most prominent ones.

On the left, 2¼ miles up the same fork is an entry into the same bed, under 3 feet of shale, with 52 inches or more of coal, the lower 4 inches in water, at altitude 1715.

The road gap to Line fork is over 200 feet above this coal and Kentucky ridge rises to a height of some 600 feet above the coal, giving it a large area in this ridge.

An old prospect by the road on the Line fork side into the Hazard bed, indicates about 4 feet of coal. The Haddix (?) coal shows a thin outcrop, 50 feet under it.

On the left, 9½ miles up Leatherwood creek, ½ mile above Stony fork, the following section is exposed at the creek, showing a slight southwesterly dip to the similar exposure, ¼ mile up Stony fork:

Thin-bedded sandstone.	
Sandy shale	4 Feet.
Coal	4"
Black shale	2"
Splint coal	5"
Fire-clay.	
Shaly sandstone and shale to creek	15 Feet.

Altitude 1200.

An old opening directly above this exposure is said to have the flint fire-clay at the bottom. An earlier visit gave the following section:

Fire-clay Coal.

Sandstone.	
Coal	6"
Shale	20 Feet.
Cannel coal	16"
Shale	3"
Coal	3"
Shale	10"
Clay	6"
Thin-bedded sandstone.	
Altitude, 1280.	

This is, doubtless, of the Fire-clay coal bed, though the clay at the bottom does not appear to be flint clay. Its altitude is strong proof of the correlation.

On the left, $10\frac{3}{8}$ miles up Leatherwood, the thin coal at the creek $9\frac{1}{2}$ miles up, appears again 20 inches thick, including two partings, under 5 feet of shale and then sandstone, at altitude 1360; rising at the rate of about 150 feet per mile.

BEECH ROCK BRANCH.

On the left, $10\frac{1}{2}$ miles up Leatherwood: Altitude of mouth, 1330.

The following section was taken mostly in the bed of the branch, $\frac{1}{8}$ to $\frac{1}{4}$ mile up it:

Massive sandstone (somewhat argillaceous)	20	Feet.
Shale	8"	
Coal	3"	
Shale with small concretions	$1\frac{1}{2}$ to $2\frac{1}{2}$	Feet.
Coal	18"	
Coal, clay and bituminous shale	2 to 3	Feet. Altitude, 1470.
Clay	4	Feet.
Shaly sandstone (concretionary boulders in the middle)	45	Feet.
Covered	5	Feet.
Sandy shale (with small concretions)	3	Feet.

Covered	4	Feet.
Shaly sandstone	3	Feet.
Bastard limestone	3	Feet.
Shaly sandstone	2	Feet.
Shale	5	Feet.
Coal	12"	
Shale	1"	
Coal	6"	Altitude, 1400.

The lower coal of the section is evidently of the same bed as that one exposed above the mouth of Stony fork and seems to represent the Whitesburg bed. The upper coal is, again, probably of the Fire-clay coal bed. This bed was found on this branch, or a short distance above it, on an earlier visit, to have 29 inches of coal with 1 inch parting 9 inches from the top, and the bottom 20 inches slickenseit.

On the right, $11\frac{1}{4}$ miles up Leatherwood, George Minyard has a 10-yard wet entry into the Hazard bed showing about 4 feet of coal, 6 inches in water, at altitude 1785.

BARK-CAMP BRANCH.

On the right, $11\frac{1}{2}$ miles up Leatherwood: Altitude of mouth, 1430.

On the left, $\frac{1}{8}$ mile up this branch, the Whitesburg bed, or a part of it, shows under 20 feet of shaly sandstone, $1\frac{1}{2}$ feet of coal at altitude 1470.

On the right, $\frac{1}{4}$ mile up the branch, John Horn has a prospect cut into the Hazard bed driven to solid cover, showing 49 inches of good splint and block coal, the lower 18 inches probably splint, under 6 feet of shale with 20 feet of massive sandstone on that. The altitude of the opening is 1800. A 30-foot cliff is exposed 10 feet below the opening and the top of a more prominent one is 80 feet below the coal.

On the left $\frac{3}{8}$ mile up the branch, at its level, an entry is driven into the Whitesburg bed showing $21\frac{1}{2}$ feet of coal including two thin partings. Its altitude is 1505. Here the coal is in part slickenseit as in the Fire-clay coal above the mouth of Stony fork.

There being some doubt as to whether the Horn coal was of the Hazard or Haddix bed, openings were

made for the Survey, to determine the question, on the right about $\frac{1}{2}$ mile up the branch. Both beds were found, one nearly under the other, 65 feet, vertically, apart, but they were not carried to full thickness of the coal. It had seemed possible that from the next opening up the creek into the Haddix bed there might be a rise to the Horn opening, but with the new openings at altitudes 1755 and 1820, it was clearly out of the question.

On the right, $\frac{3}{4}$ mile up the branch, L. Shepard has a new opening giving the following bed section:

Haddix Coal.

Earth.	
Coal	54"
Clay	11"
Coal	1"
Clay	4"
Coal	2"
Altitude, 1760.	

Carbonate iron ore lies about 15 feet below the coal.

An attempt was made to open the same bed on the opposite side of the branch, but failed of getting satisfactory thickness, probably because of broken rock in the way.

On the right, 1 mile up the branch, E. R. Whittaker has a 25-yard entry giving the section following:

Haddix Coal.

Shale	10	Feet.
Coal	8"	
Shale	1½	Feet.
Coal (about)	79"	
Altitude, 1775.		

About 2 feet of coal in the bottom is not used. Some of it is slickenseit and it is said not to be suitable for welding. The upper part of the two feet seemed to be a sort of rash coal, but with $1\frac{1}{2}$ feet of water at the mouth of the entry it was not clearly investigated.

On the right, $1\frac{1}{2}$ miles up the branch, Eli Whittaker has a closed entry into the Haddix bed, 75 feet above the branch, showing, under sandstone, about 3 feet of coal,

including one foot under water, at altitude 1790. An opening on the left of the branch is entirely closed.

The gap to Long branch, of Line fork, is 2 miles up Bark-Camp branch, and its altitude is 1974, giving over 100 feet of covering to the Hazard bed, and several hundred feet more on Kentucky ridge away from the gap.

The Haddix coal is opened $1\frac{1}{4}$ miles down Long branch, under 5 feet of shale, with coal reported 9 feet thick including two partings of about 3 and 5 inches. The coal still visible in the cut is confirmatory of the report. Its altitude is 1635 (?). An entry into the Fire-clay, $1\frac{3}{4}$ miles down Long branch, gives about 3 feet of coal, 200 feet below the Haddix opening.

On the left, $11\frac{5}{8}$ miles up Leatherwood creek, $\frac{1}{8}$ mile above Bark-Camp branch, is exposed the following:

Whitesburg Coal.

Sandstone.	
Shale	10 Feet.
Coal and thin parting	1½ Feet.
Shale (to creek level)	25 Feet.
Altitude, 1465.	

On the right, $11\frac{3}{4}$ miles up Leatherwood, W. R. Shepard has a wet entry into the Hazard bed, under soft sandstone, having about 4 feet of coal, at altitude 1805.

A 20-foot cliff lies immediately below it.

From this point the same rock can be seen in a cliff across the creek, and below it, under the Haddix coal another line of cliffs, dipping rapidly down stream from the mouth of Bark-Camp branch, while above that branch it lies nearly level, possibly with a slight up-stream dip. The top of the cliff under the Hazard coal is at altitude 1780, in the vicinity of an old Hazard coal opening, not found, on a left branch 13 miles up Leatherwood creek.

**REPORT ON
THE COALS OF GOOSE CREEK
AND ITS TRIBUTARIES
IN CLAY AND KNOX COUNTIES, KENTUCKY
BY
JAMES M. HODGE
1914**

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THE COALS OF GOOSE CREEK AND ITS TRIBUTARIES.

This report follows a recent examination in detail of practically all coal openings which were open to inspection on Goose creek and its tributaries in Clay and Knox counties.

A general review of the field is first presented, after which follow details of the coal openings visited, including correlations where practicable, and other comments as they appear pertinent.

The accompanying map gives the principal streams as recently surveyed for the purpose by the State Geological Survey, the location and altitude above tide of most of the coal openings visited and of some of the principal points along Goose creek and Collins fork, the latter as determined by lines of levels by the same survey. With these levels for use as a base, heights of coal openings were determined by barometer, and are considered sufficiently accurate for use in this report, being much more so than when reliance had to be placed on topographical contours for basic heights.

The topography of the basis, as elsewhere in this coal field, consists of narrow valleys enclosed by steep ridges with sharp summits, the hills varying in height generally from 400 to 800 feet above the valleys, the highest being in Kentucky ridge at the head of the creek. A reduction of average height and steepness from the east toward the west seems to have resulted from more rapid weathering westward, due to replacement of sandstone by shales in that direction.

The measures exposed above drainage include nearly 200 feet of the measures below the Manchester coal, on Little Goose creek, and probably about 1,000 feet of strata above the same coal on the upper part of Goose creek, the highest part being exposed in Kentucky ridge.

Though many of the streams have had their course determined by the dip of strata along them, such is not the case with many others. The prevailing dip in the section south from Manchester to Hammond fork of Collins fork and to Mill creek is southeastward, but the whole region is greatly diversified with irregularities both in direction and amount of dip, making especially careful examination necessary for correct correlation of strata. The dip is generally very slight, rarely exceeding 3% and then only for very short distances.

The measures below the Manchester coal have normally a hard sandstone near the top with soft shales overlying that. Cliffs are formed where the streams break through this sandstone, and broad benches or even plateaus are prominent above them.

The sandstone under the Fire-clay coal, which, on streams northeast from Goose creek, is hard and cliff-forming in narrow ravines where the streams have but lately broken through it, like the hard sandstones, under the Manchester coal, is softer on Goose creek waters and its identity therefore much less easily established excepting through the coal beds of the locality.

The sandstone between the Haddix and Hazard beds retains its propensity for cliff-making, but in general is too closely associated with other hard sandstones for identification. In a number of places, however, the flatter topography immediately above it serves as an excellent guide in that respect. On the whole the sandstones afford little aid to correlation, and reliance for that must be based on the coal beds.

The principal coal beds of the region are given in descending order in the following general section, with the intervals between them as approximately ascertained:

Hindman Coal Bed.
Interval 100 to 150 feet.
Flag Coal Bed.
Interval 40 to 80 feet.
Hazard Coal Bed.
Interval 50 to 60 feet.
Haddix Coal Bed.
Interval 160 to 190 feet.

Fire-clay Coal Bed.
Interval 30 to 60 feet.
Whitesburg Coal Bed.
Interval 250 feet.
Howard Coal Bed.
Interval 250 feet.
Manchester Coal Bed.

There is above the Hindman bed (probably about 50 feet) another coal which may become of importance about the head of Goose creek, but as yet neither that bed nor the Hindman has been positively identified in the region covered by this report; the areas of both, large enough to consider workable, are confined to the high ridges of Mill creek and the streams above it.

THE FLAG COAL BED, with good areas extending considerably farther north and west, is of variable thickness and quality, notably in part cannel coal. The few openings where the coal could be seen to be of good thickness were too high in the hill to be attractive, but it is quite possible that the bed may have good areas of thick coal not yet discovered.

THE HAZARD COAL BED has fewer openings now uncovered than the Flag bed, and those that have been abandoned indicate generally a poor bed. The approximate location of the bed is often shown by the flatter topography, and usually at such places a point can be found where the bed may be opened with little difficulty.

THE HADDIX BED seems to be the most valuable of the higher ones, not only because of larger area, but apparently also because of usually workable, though variable, thickness. Its height in the series of strata renders it improbable that workable areas of the bed will be found farther north than the mouth of Otter creek.

THE FIRE-CLAY COAL BED (and its rider) where fully identified are not of workable thickness, but a bed with 3 to 4 feet of coal near the hill-tops at the head of Buzzard creek and on Hammond fork, with some good areas there, is tentatively ascribed to the Fire-clay coal horizon. Also, with some doubt as to correlation, is the 4-foot coal at the main head of Goose creek at the base of Kentucky ridge.

THE WHITESBURG BED, though found at a number of places, gives no satisfactory coal.

THE HOWARD BED, so called from the name of the owner of the best known entry into it on Goose creek, has good area of workable thickness between Lockhard and Otter creeks notwithstanding a split in it south of Martins creek. It appears to be at its best in the vicinity of Goose Rock Postoffice, and is found workable on lower Collins fork and Buzzard creek, but is split into rather thin parts elsewhere, excepting on Beech creek, near its head, where an apparently unimportant thickening has obtained.

About 100 feet above the Manchester bed is a thin coal which seems to be persistent, seen at a number of places above Horse creek and evidenced by its bench on streams below that creek, but apparently never opened.

THE MANCHESTER BED is the only known coal of consequence on Goose creek waters from its mouth to Collins fork, excepting the probably narrowly limited area of the Howard bed on Beech creek.

The variable dips and consequent heights of openings, distance of the bed from the hard rock under it (anywhere from 1 to perhaps 30 feet), change in character of roof from shale to sandstone, and, on Kincaid branch of Little Goose creek, change in the coal itself from common bituminous to cannel coal, have led to diverse views of correlation, which required thorough detailed study to correct. Nearly all old as well as new openings were therefore visited in order to get their altitudes, and a final and, for most of the region, conclusive check was obtained by measurement of the interval up to the Fire-clay coal at points where its flint clay parting rendered its identification certain. This was done near Oneida and again above Collins fork.

The absence of any other bed of consequence within 200 feet of the Manchester bed in the vicinity of Goose creek renders correlation of the bed in outlying districts sufficiently sure.

The bed lies near creek level along Goose creek to Laurel creek, dipping quickly under the eastern tributaries and rising with those on the west. From Laurel creek to Manchester there is a gradual rise excepting for a narrow sharp depression running from the mouth of Bowling branch to and perhaps beyond Sedra postoffice on Beech creek.

On Laurel, Island and Little Goose creeks the bed rises to from 100 to nearly 200 feet above streams and continues above them nearly to their heads. On Horse creek it runs some 30 feet above creek level to near its head, and on Collins fork, dropping below water level near its mouth is still within easy reach to near the mouth of Whites creek. It is below water level after the first quarter mile up Goose creek above Collins fork.

The coal of this bed varies in thickness from 1 to $4\frac{1}{2}$ feet, but runs generally from $2\frac{1}{2}$ to 3 feet thick, with partings rare and usually in the thicker coal, which is mostly not far from the main creek and on Horse creek and close above stream level, varying very little in quality, excepting where changed to cannel coal. Eighteen analyses from samples taken from points well distributed throughout the field show the following ranges of constituents:

(Analysis of one outcrop sample, high in ash, not included.)

Moisture	from 1.07 to 2.15%
Volatile combustible matter .. .	from 33.20 to 38.10%
Fixed carbon	from 54.60 to 59.60%
Ash	from 2.94 to 7.52%
Sulphur	from 0.47 to 2.65%

Where local preference obtains for coal from one entry rather than another it may usually be explained by difference in distance from outcrop or by clean mining rather than by inherent difference in the coal. The numerous places where coal has been stripped under shale along the hill sides argues a coal well adapted to long weathering in storage.

THE BEATTYVILLE COAL BED, which at Beattyville has been estimated to be 200 feet below the Manchester bed, is below drainage throughout this field, but if the interval remains the same the bed is close below on Little Goose creek, and may be the one found in Gray fork near its mouth. A thickening of the lower measures southward from Beattyville and a consequent increased interval is, however, more probable.

The following pages are devoted to a description in detail of the openings visited, with notes of other items

which should aid in an understanding of the geology of the region.

The description is arranged in geographical sequence from Oneida, at the mouth of Goose creek to its head, each tributary and its branches, on which coal was found being taken up as they are met in progress up the main creek. The terms left and right are used as when looking up the creek.

Surface distances given in miles were mostly obtained from the map without attempt at great accuracy. Those given from Oneida and from Manchester as bases give the approximate distances following the principal bends in the creek, and are therefore in excess of the corresponding distances by road. Underground distances in yards are also given as rough approximations only. Entries are called long which were carried beyond the range of the examination made.

Thickness of strata given in feet are approximations; when given in inches they may be relied upon as correct.

Altitudes given in multiples of five unless otherwise stated were obtained by barometer or in cases of mouths of branches by interpolation from known altitudes where available and in some instances from estimation of the rates of fall of the stream into which the branches flow. Other altitudes were obtained by spirit leveling.

In Oneida, on the right of the road up Goose creek, Prof. J. A. Burns has a long entry into the Manchester bed, which, where measured 5 yards in, has 31 inches of coal under a shale roof. It is 45 feet above Goose creek and at altitude 772. About 150 yards farther west than the above, the coal is 32 inches thick 3 yards into the entry. Altitude 775.

Coal delivered at Oneida from some of the entries in the neighborhood is complained of as being slaty while from other entries it comes clean. The defect appears to be due to inclusion of slate from the roof and not to impurity of the bed itself, although there is too much ash in the coal for a first class fuel. The following analysis of the coal, 33 inches thick, from an entry on Goose creek near Oneida, obtained from a private source, shows this, as well as a percentage of sulphur unusually high for this coal:

Manchester Bed.

Moisture	1.07
Volatile combustible matter .	36.51
Fixed carbon	55.82
Ash	6.60
100 00	
Sulphur	2.65

A quarter-mile farther up the road, on the right, $\frac{1}{8}$ mile up a right branch, Arch Roberts has 27 inches of coal under 10 feet of shale, the coal being measured 4 yards into a long entry. Altitude, as obtained, 790.

LICK BRANCH.

On the right, $\frac{1}{2}$ mile from Oneida.

On the left, $\frac{1}{2}$ mile up the branch, 10 feet above it, is a closed entry at altitude 785.

SHARPER BRANCH.

On the right, 1 mile from Oneida.

In the branch, $\frac{1}{4}$ mile up it, is a pit giving about $2\frac{1}{2}$ feet of coal at altitude 770.

On a left branch of Goose creek, $1\frac{3}{8}$ miles from Oneida, on the right, $\frac{1}{8}$ mile up the branch, Squire Hensley has, under 10 feet of shale, coal varying from 27 to 30 inches in thickness at 3 yards into the entry. Its altitude is 765.

On the right of Goose creek and of the road, $1\frac{1}{2}$ miles from Oneida, G. W. Hyden has an entry with coal 28 inches thick 2 yards in. Altitude 760. On the coal is 5 feet of shale and 10 feet above that is 20 feet of sandstone.

FURNACE BRANCH.

On the right, $2\frac{1}{2}$ miles from Oneida. Altitude of mouth, 730.

A quarter-mile up this branch the Manchester coal has been taken from a pit in the branch at altitude 750. The top of the first cliff above the coal by the mouth of the branch is at altitude 835. The top of a second cliff, 965.

LAUREL BRANCH.

On the left, $3\frac{1}{4}$ miles from Oneida. Altitude of mouth, 735. The top of the first cliff above the Manchester coal appears to be about on the level of the forks of the branch, $\frac{3}{8}$ mile up it, at altitude 805, and the coal itself beneath drainage here.

A quarter-mile up the right fork and $\frac{1}{8}$ mile up a right hollow. William Bowling has the Fire-clay coal opened with the following section at the face of the entry, 6 yards in:

Fire-clay Coal.	
Massive sandstone	5 Feet.
Coal	10"
Flint fire-clay	5"
Coal	18"
Altitude, 1225.	

While from creek level the top of the first cliff above the Manchester coal seems clearly defined at the mouth of Furnace branch and along the creek on the left to the mouth of Laurel branch and up the latter, the top of the sandstone, after it is reached, shows such variation in level that measurement of altitude cannot be exact. Nevertheless it is, perhaps, as accurate as barometric observations permit, and a dip from Furnace branch to the forks of Laurel is evident.

Assuming that this dip, amounting to 30 feet as ascertained, continues to a point under the Fire-clay coal opening and allowing 15 feet additional pitch in that distance from the forks of Laurel, would put the top of the sandstone at altitude 790 and the Manchester coal, 90 feet lower, at altitude 700. The Fire-clay coal is then here about 525 feet above the Manchester coal.

On Hacker branch, a half-mile above Laurel branch, the top of the first cliff appears to be at altitude 800 at the forks of the branch, $\frac{1}{4}$ mile up it.

WILDCAT BRANCH.

On the right, $4\frac{1}{2}$ miles above Oneida: Altitude of mouth, 740.

On the left, $\frac{1}{4}$ mile up and 5 feet above the branch, at altitude 755, is 5 inches of coal, which at an old open-

ing 50 yards farther up is said to have increased to 30 inches. The exposed rocks there indicate the presence of but one bed of coal.

A half-mile up to the forks and $\frac{1}{4}$ mile up the right fork a pit in the branch is said to have yielded 30 inches of coal.

On the left fork, $\frac{1}{4}$ and $\frac{1}{2}$ mile up, are pits at altitudes 785 and 805, also reported with 30 inches of coal. These give a rise up stream of 60 to 80 feet per mile. The bed is reported in the branch a mile up the left fork, of like thickness, and to continue to rise above the branch farther up. All of these are of the Manchester bed.

CONOLLEY BRANCH.

On the left, 6 miles from Oneida: Altitude of mouth, 745.

At Daniel Davidson's, $\frac{3}{4}$ mile up the branch, is 8 inches of coal at altitude 865. In the branch, $\frac{7}{8}$ mile up, is said to be a foot of coal at altitude 915.

In the branch a mile up is about 16 inches of coal, under 4 feet of shale, at altitude 1105. These coals may be of the lower and upper splits of the Howard bed and of the Whitesburg bed.

On the right of Goose creek at low water level, $6\frac{7}{8}$ miles from Oneida, the Manchester coal has been opened, said to be 2 feet thick, at altitude 745.

On the left, $7\frac{1}{8}$ miles from Oneida, T. Spurlock has an entry, under good shale roof, with 24 inches of coal 10 yards in. Its altitude, 765, gives a considerable rise from the coal in the creek, but the inclination of the rocks in the creek bank opposite the mouth of Little Wildcat shows that such a dip is probable.

On the right, $7\frac{1}{2}$ miles from Oneida, a closed entry at altitude 780 shows the up-stream rise of strata continuing but at a less rate. Four inches of iron ore, in shale, lies 25 feet under the coal.

BEECH CREEK.

On the left, 8 miles above Oneida: Altitude of mouth, 752.

On the left, $\frac{1}{8}$ mile up Beech creek, the Manchester coal shows 26 inches thick, under shale, at altitude 775.

LITTLE BEECH.

On the left one mile up.

A mile up to the forks of Little Beech, on the left $\frac{1}{4}$ mile up the right fork, F. Desarn has a 4-yard entry into 23 inches of coal, under black-jack roof, at altitude 900. The strata apparently dip but slightly from the mouth of the creek to this point, making this of the Howard bed, probably the lower split.

On the right, $\frac{1}{4}$ mile up a left branch, 4 miles up Beech creek near Cedral postoffice, Jefferson Jones has a 5-yard entry into 41 inches of coal at branch level, altitude 935, analysis of which (No. G 3582) from my sample taken from the face, 5 yards in, is given on a following page.

The bottom 5 inches is very heavy, but is said to burn finely; that along with nearly a foot more coal in the bottom block, becoming a poor cannel coal nearby as shown below. Eight inches from the top is 3 inches of coal inclined to be bony. The roof is shaly sandstone.

On the right, $4\frac{1}{8}$ miles up, Thomas Gregory has a 30 yard entry into the same bed giving 40 inches of coal at the face, with 15 feet or more massive sandstone covering. An earlier visit to the J. M. Jones adjacent opening gave the following bed-section:

Shaly sandstone.	
Shale	2"
Coal	10"
Shale	2"
Coal	22"
Cannel coal	15"
Black slate	3"
Shale	6"
Altitude, 955.	

Analyses of the cannel and bituminous coals made by Dr. R. Peter from my samples follow. Both give results unduly high in ash because of included mud, but the cannel sample evidently included, also, black slate from the bottom of the bed, to which the cannel changes by imperceptible degrees. It is evident from the appearance of the coal at the Jefferson Jones entry that but about 10 inches of the cannel should have been sampled

for favorable results, but to leave the bottom 5 inches would be impracticable in mining. The high ash of the sample from the Jefferson Jones entry is undoubtedly due to the poorer quality of the lower 10 inches of the bed and to the bony coal higher up.

The recent Jefferson Jones coal analysis is given under Laboratory No. G 3582, the J. M. Jones cannel under No. 2652 and of bituminous coal under No. 2651.

Laboratory No.	Analyses.		
	G 3582.	2652.	2651.
Moisture	0.94	0.42	0.92
Volatile combustible matter	40.38	32.38	37.54
Fixed carbon	45.27	35.20	53.44
Ash	13.41	32.00	8.10
	100.00	100.00	100.00
Sulphur	3.23	6.042	1.601
Coke	rather dense	dense	spongy
Specific gravity			1.313
Color of ash	gray	brown	light brownish gray

At this locality coals were formerly found as shown below, but owing to a quite strong easterly dip showing here the intervals between them are not very reliable.

Coal	16"	1195
Coal		1140
Coal	12"	1010
Coal	47"	955
Coal	13"	910
Beech creek at Cedral.....		895

The lowest coal has 10 feet of shale above and below it; all the others sandstone roof.

The lower two coals are undoubtedly the two splits of the Howard bed (found on Hart branch) and the upper coal near to the Fire-clay coal bed.

From Cedral to the Hart Creek gap, along the road to Manchester, benches and rock exposures both show

On the left, $2\frac{1}{8}$ miles up Laurel creek, James Barnett has a closed entry, at altitude 930, said to have 3 feet of coal.

ORCHARD BRANCH.

On the right, $2\frac{1}{4}$ miles up Laurel creek: Altitude of mouth 830.

On the left, $\frac{1}{2}$ mile up the branch, John Howard has a closed entry into the Manchester bed at altitude 965, having apparently 2 to $2\frac{1}{2}$ feet of coal.

COLLINS BRANCH.

On the right, $2\frac{3}{8}$ miles up Laurel.

On the right fork, one mile from Laurel creek, a pit on the right of stream and road, at water level, altitude 935, gives 2 feet of coal under black slate with 20 feet of shale upon that.

On the left fork at about the same height and distance from Laurel creek are former openings now covered, all of the Manchester bed.

On the right, $2\frac{3}{4}$ miles up Laurel creek, Hannibal Morgan has a long entry at altitude 945, with coal 32 inches thick 11 yards in. Sandstone lies close below and black slate immediately above it.

At Washington Craft's, 3 miles up are two entries, one on the right at altitude 985 with about 28 inches of coal at its mouth, under 6 feet of shale; the other on the right of a left branch, at altitude 975, and 110 feet above the creek, also with shale roof.

On the right, $3\frac{1}{4}$ miles up, Daniel Baker has a long entry into this same bed with the following section, the coal face being measured 12 yards in:

Manchester Bed.	
Shale	5 Feet.
Black slate	6"
Coal	9"
Bone Coal	1"
Coal	17"
Altitude, 1005.	

On the left, $3\frac{7}{8}$ miles up, George Hall has a long entry with the following section at its mouth:

Manchester Bed.

Shale.	
Coal	4"
Shale	1"
Coal	31"
Altitude, 995.	

FALLS BRANCH.

On the left, 4 miles up Laurel creek: Altitude of mouth, 890.

On the left, $11\frac{1}{4}$ miles up the branch, Elijah Campbell has a long entry into the Manchester bed at altitude 1020, and 25 feet above the branch. At 3 yards in the coal measures 35 inches, under shale roof.

A pit in the branch at its head, $13\frac{1}{4}$ miles up, gives the altitude of the bed there, 1055.

HOGSKIN BRANCH.

On the left, $4\frac{1}{2}$ miles up Laurel.

On the left, $13\frac{1}{4}$ miles up the branch, a pit again gives the altitude 1085, the gap to Rader creek being at 1180.

On the left of Goose creek, $9\frac{1}{2}$ miles from Oneida, an opening in the point of a hill shows the Manchester coal 26 inches thick, under 10 feet of shale, at altitude 815.

On the left, $9\frac{7}{8}$ miles up, the bed is reported as having two seams of coal, each 2 feet thick, 4 feet apart, but the openings are now covered. No evidence having been seen of more than one bed in this vicinity it is more than likely that the current reports of two almost in contact are derived from the finding of the one bed in two adjacent places at slightly differing altitudes, a not uncommon occurrence in this region.

On the right, 10 miles from Oneida, in front of the Morgan house the stain of the coal shows at altitude 835. Cannel coal is said to have come from a slip at 930 but no sign of coal remains there now.

On the left of a right branch, $\frac{1}{8}$ mile up it and $11\frac{1}{8}$ miles from Oneida, James Townsend has a 10-yard entry into the Manchester coal at altitude 890. At 4 yards in the coal is 26 inches thick: 30 feet of shale and sandstone overlies it.

On the right, $11\frac{3}{8}$ miles from Oneida an old opening shows the coal at altitude 855, while 30 feet below it is a bench which shows almost continuously, and prominently from Laurel creek to Manchester.

JACKS CREEK.

On the right, $11\frac{3}{4}$ miles from Oneida.

On the right, $\frac{1}{8}$ mile up the branch, the stain of the Manchester bed shows in the road at altitude 840. Thirty feet under this is an iron ore stain, corresponding with the ore under the opening next below Beech creek.

On the left, $\frac{1}{2}$ mile up, are pits at altitude about 840, 20 feet above the creek.

On the left of a right branch $\frac{1}{2}$ mile up and $\frac{1}{4}$ mile up the branch James Keith has a long entry, at altitude 845, with about 3 feet of coal. Private analysis of coal 37 inches thick, presumably from this entry gave the following results:

Manchester Bed.	
Moisture	1.80
Volatile combustible matter ..	33.75
Fixed carbon ..	58.85
Ash ..	5.60
	<hr/>
	100.00
Sulphur	0.80

These three Jacks creek coal altitudes show the bed nearly level in this vicinity, but those farther up show a rapid rise. On the left, $1\frac{1}{4}$ miles up, a closed entry at altitude 865 is said to have coal 28 inches thick.

On the left, $1\frac{7}{8}$ miles up, an old stripping lies at altitude 915.

On the right, 2 miles up, is an old stripping with coal, said to be 26 inches thick, at altitude 925. Forty feet or more of shale lies on this coal, as evidenced on the road over the divide to Island creek.

The clearly defined benches along Jacks creek, 70 and 100 feet, approximately, above the coal are especially to be noted, as they appear elsewhere over it, though nowhere so distinct. Here the lower one is most prominent, but on Island and especially on Little

Goose creek where it becomes the principal bench the upper one is more conspicuous.

On the right, by the road up Goose creek, $12\frac{1}{2}$ miles from Oneida, and again $12\frac{3}{4}$ miles, black shale appears at altitude 785, under heavy sandstone and about 70 feet below the place of the Manchester coal as judged by the plateau like bench formed by the sandstone at the top of the conglomerate formation.

On the left, $13\frac{1}{8}$ miles from Oneida, an old opening into the Manchester bed shows about 70 feet above the creek, or at altitude 860.

On the right, $13\frac{3}{8}$ miles above Oneida ($\frac{1}{8}$ mile above the oil-pump station) a closed entry under 15 feet of shale is at altitude 820.

On the left, $13\frac{3}{4}$ miles from Oneida is a long entry into the Manchester bed with coal increasing from 51 to 53 inches at 5 to 15 yards in. Water in the entry prevented following farther; the maximum is reported 56 inches. Its altitude at its mouth is 795 and it dips in going in quite rapidly to the east.

A private analysis with coal given as $54\frac{1}{2}$ inches, including $\frac{1}{2}$ inch of bone coal in the middle, gives results as follows:

On the left, 14 miles from Oneida is a prospect, 5 feet above the creek, with coal, by the same authority, 33 inches thick and analysis as follows:

Manchester Bed.		
	Entry.	Prospect.
Moisture	1.44	7.00
Volatile combustible matter ..	35.50	34.40
Fixed carbon ..	55.54	50.30
Ash ..	7.52	8.30
	<hr/>	<hr/>
	100.00	100.00
Sulphur	0.81	0.60

Comparison of altitudes of the Manchester bed shows a quite rapid dip to this point from down stream and up also, accounting for the sharp bend in the creek here. That this dip continues to Beech creek is evidenced by the fact that the Manchester coal at Cedral is at a much lower altitude, estimated about 700.

On the left, $14\frac{1}{2}$ miles from Oneida, on the late N. Cotton farm, old strippings show the bed at altitude 820.

On the right, 15 miles from Oneida, a closed entry shows the bed at altitude 835. A quarter mile farther up, the black shale about 70 feet under the coal emerges from the creek at altitude 775, and thence to Bowling branch it shows a gradual rise.

On the left, $15\frac{3}{8}$ miles from Oneida, at Napoleon Cotton's, a cliff by the creek gives the following section:

	Feet	
Massive sandstone	3	0"
Sandy shale	12	0"
Coal	5	0"
Covered	5	0"
Thin bedded sandstone to creek	5	0"
Altitude, 785.		

This coal is probably about 100 feet below the Manchester bed.

BOLLING BRANCH.

On the right, $15\frac{1}{2}$ miles from Oneida: Altitude of mouth, 775.

On the left, along the road to 100 yards up this branch, black shale shows with a strong southeast dip at altitudes 825 to 840. The strata are supposed to lie in a small wave here with the crest near where the shale disappears at altitude 840.

On the right, $\frac{1}{4}$ mile up, are closed pits into the Manchester bed at altitude 885.

On the right, $\frac{1}{2}$ mile up, E. B. Treadway has a 3-yard entry, under 4 feet of shale, with 35 inches of coal at its mouth: It is 10 feet higher than the branch, and at altitude 890.

On the left, $15\frac{3}{4}$ miles from Oneida, an old prospect gives the Manchester bed at altitude 915. This is higher than surrounding openings into the same bed and gives cause for the long western bend of Goose creek to the mouth of Island creek.

ISLAND CREEK.

On the right of Goose creek, $16\frac{1}{4}$ miles from Oneida: Altitude of mouth, 780.

Black and yellow shales belonging some 20 feet under the Manchester coal cover the long spur at the school house on the right at the mouth of the creek, the altitude there being 900. Under these is the sandstone which, particularly conspicuous on Island creek and neighboring streams and at Manchester, provides the base for a considerable plateau, the streams having cut down through it into narrow gorges, usually short and not deep.

On the left, at the ford, $\frac{1}{2}$ mile up, the black shale 70 feet under the coal, appears in the road at altitude 820.

On the left, $\frac{3}{4}$ mile up the creek, $\frac{1}{4}$ mile from it, opposite the head of Needmore branch, the Manchester coal has been taken from a pit at altitude 900.

The creek forks about $11\frac{1}{2}$ miles up at altitude 830.

RIGHT FORK.

On the right, $\frac{1}{2}$ mile up, at David Roark's, is 6 inches of coal under 5 feet of shale and on 3 feet of rough sandstone, at altitude 895, five feet above the creek. The coal is probably an offshoot from the Manchester bed.

On the left of a right branch there, $\frac{1}{8}$ mile up it, he has a new opening into the Manchester bed with coal 26 inches thick and earth cover at altitude 945. Allowing 20 feet for dip between these two coals brings them 20 feet apart.

On the right, $\frac{3}{4}$ mile up the fork, is an old stripping at altitude 975.

On the left, $1\frac{1}{4}$ miles up, on the road to the head of Jacks creek, a closed entry gives the Manchester bed at altitude 985.

LEFT FORK.

On the left, $\frac{3}{4}$ (?) mile up, Jones and Keith have a stripping, close above the cliff sandstone, with 26 inches of coal at altitude 955, 50 feet above the creek.

On the right of Goose creek, $16\frac{3}{4}$ miles above Oneida, George Robinson has strippings into the Manchester bed at altitude 875.

On a left branch, $18\frac{1}{4}$ miles from Oneida on the right, $\frac{1}{8}$ mile up the branch, at the back door of Harvey Cotton's house, is his entry into coal 23 inches thick at the face 4 yards in. Fifteen feet of shale overlies the bed, which here is at altitude 875.

HART BRANCH.

On the left, $18\frac{3}{4}$ miles from Oneida: Altitude of mouth, 790.

In Hart branch, $\frac{1}{4}$ mile up it, at the mouth of the branch heading near Manchester, the black shale under the Manchester coal shows at altitude 805.

On the same little branch, $\frac{1}{8}$ mile up it, and in the road to Manchester, the stain of the Manchester coal is at altitude 870.

COAL HOLLOW.

On the right, $\frac{5}{8}$ mile up Hart Branch.

On the right, $\frac{1}{4}$ mile up, a closed entry, 5 feet above the branch, gives the Manchester coal at 875.

On the right, $\frac{3}{4}$ mile up Hart branch, is a stripping of the same bed with coal 24 inches thick and altitude 865.

A slight dip up stream carries that bed to about altitude 840 at the mouth of the branch leading to Beech creek, $1\frac{1}{2}$ miles up Hart branch.

On the right of that left branch, $\frac{1}{4}$ mile up it, a thin coal under 5 feet of shale has been opened at altitude 980; the lower split of the Howard bed.

On the left, $\frac{3}{8}$ mile up this branch, Mrs. Patrick has an 8-yard entry giving the following section:

Sandstone	4 Feet.
Coal	12"
Bituminous shale ..	3"
Coal	11"
Black slate.	
Altitude, 1020.	

The bed is said to be 3 feet thick at the face of the entry.

It is undoubtedly of the same Howard bed as the Jones entry of Beech creek, though 65 feet higher, giving a northeasterly dip of over 80 feet to the mile.

The same bed is opened on the right, $2\frac{1}{4}$ miles up Hart branch, in a 15-yard entry giving the following section, the coal measured 3 yards in:

Massive sandstone	10 Feet.
Shaly sandstone	1 Foot.
Coal	16"
Bituminous shale ..	6"
Coal	10"
Altitude, 1080.	

The strata appear to lie nearly level up from the mouth of the branch to Beech creek, this coal being then here 200 to 250 feet above the Manchester coal.

On the right of Goose creek, 19 miles from Oneida, the Manchester coal has been stripped, with thickness reported 24 to 26 inches, at altitude 915.

NEEDMORE BRANCH.

On the right, $19\frac{1}{2}$ miles from Oneida: Altitude of mouth, 790.

On the right, $\frac{1}{4}$ mile up the branch, C. D. Lytle has a long entry, giving 24 inches of coal, 3 yards in, under shale, at altitude 885. A ledge of sandstone 35 feet thick lies 20 feet under it, and black shale, in the road, 70 feet under, altitude 815.

On the right $\frac{3}{8}$ mile up, the coal has been opened at altitude 890, and again, $\frac{1}{2}$ mile up, at 875.

On the left, $\frac{3}{4}$ mile up, a long entry has 27 inches of coal 5 yards in, at altitude 880.

A private analysis of coal, 30 inches thick from this branch, is reported with the following results:

Manchester Bed.	
Moisture	1.50
Volatile combustible matter.....	34.20
Fixed carbon	57.60
Ash	6.70
	100.00
Sulphur	1.95

LITTLE GOOSE CREEK.

On the right, 20 miles from Oneida: Altitude of mouth, 792.

GREENBRIER BRANCH.

On the right, $\frac{1}{2}$ mile up Little Goose creek: Altitude of mouth, 795.

On the right, a mile up this branch, is a stripping of the Manchester bed at altitude 950, and again, $1\frac{1}{4}$ miles up, the latter with 25 inches of coal under 8 feet of shale, at altitude 960.

STONE COAL BRANCH.

On the right, 2 miles up Little Goose creek: Altitude of mouth, 810.

On the left, and left of road to Manchester, $\frac{1}{4}$ mile up the branch, an old opening shows the Manchester bed at altitude 890.

On the right, $\frac{1}{4}$ mile up, is 2 feet of black shale under a sandstone ledge, as on Island creek and Needmore branch, at altitude 850. In the branch, farther up, this shale shows again, rising to altitude 860 before it disappears.

On the left, $\frac{3}{8}$ mile up, is an old opening into the Manchester bed at altitude 910, and on the right, $\frac{1}{2}$ mile up, another at the same height.

On the left, $\frac{5}{8}$ mile up, a pit in the branch gives the bed at altitude 915. These three openings are on S. B. Caudill's land.

Benches appear on this branch about 50, 75 and 95 feet above the coal.

On the right of a right branch, by the road to Ephraim creek, $\frac{3}{4}$ mile from Little Goose creek, S. A. Asher has a 3-yard entry into the same bed, with covering differing from those heretofore given, the section being:

Manchester Bed.	
Sandstone.	
Clay	1"
Shale	8"
Coal	33"
Altitude, 940.	

On the left of Little Goose creek, $3\frac{3}{8}$ miles up it, Edward Garrison has a stripping into the same bed with 15 feet of shale, much of it black, over the hidden coal. Its altitude is 910.

ROARK (OR SHED) BRANCH.

On the right, $3\frac{3}{8}$ miles up Little Goose creek: Altitude of mouth, 830.

On the left, $\frac{1}{4}$ mile up this branch, John Garrison has a stripping with coal of the Manchester bed, 30 inches thick with 8 feet of shale, part black, exposed above the coal at altitude 950.

By the road at the mouth of the branch is shale, part black, at altitude 840 to 870. Most of this shale appears to have replaced in part the sandstone along Goose creek, a change which seems to prevail to a large extent in going westward from that stream.

RADER CREEK.

On the right of Little Goose creek, $3\frac{1}{2}$ miles up it: Altitude of mouth, 830.

On the right, $\frac{1}{4}$ mile up, Mrs. Lucy Ledford has a closed pit into the Manchester bed at altitude 980.

On a left branch, $\frac{1}{2}$ mile up Rader creek, on the right $\frac{1}{4}$ mile up the branch, the Cotton heirs have a long entry into the same bed, with 30 inches of coal 5 yards in, at altitude 1035.

On the right, $\frac{1}{2}$ mile up the branch, the coal is also 30 inches thick at the face of a 4-yard entry, at altitude 1055.

SPICE GAP BRANCH.

On the left, $1\frac{3}{4}$ miles up Rader creek: Altitude of mouth, 925.

On the right, $\frac{1}{2}$ mile up, in a long entry into the Manchester bed with 35 inches of coal 12 yards in. Its altitude is 1045.

By William Ponder's mill, on the right, $1\frac{7}{8}$ miles up Rader creek, the same bed has 32 inches of coal at the face of a 15-yard entry at altitude 1020.

RICH HOLLOW.

On the right, 2 miles up Rader creek.

On the left, $\frac{1}{4}$ mile up the hollow, William Ponder has a long entry into the Manchester bed with 30 inches of coal 5 yards in, under 5 feet of shale. Its altitude is 1035.

On the right, at Sidell Postoffice, $2\frac{1}{2}$ miles up Rader creek, James M. Baker has a 12-yard entry under shale into the same bed with 30 inches of coal at the face, at altitude 1030, 50 feet above the creek.

SANDLIN BRANCH.

On the right, 3 miles up the creek: Altitude of mouth, 1000.

At William Sandlin's, $\frac{1}{2}$ mile up the branch, and in it, under 8 feet of shale, is a pit with Manchester coal said to be 30 inches thick, altitude 1070.

At John Gibson's $3\frac{3}{8}$ miles up Rader creek, on the left, $\frac{1}{4}$ mile up a left branch, is the same bed opened in a pit with coal reported 2 feet thick, at altitude 1080.

On the left, at Tip Barron's mill, 4 miles up the creek, it is again reported 2 feet thick; its altitude not taken.

On the right, $4\frac{1}{4}$ miles up Rader creek, James Lewis has a pit into the same bed at altitude 1090.

On the left, by the road, $4\frac{1}{2}$ miles up the creek, Noah Resner has a pit into the same bed with 22 inches of coal, at altitude 1100.

Again it is opened in a pit in the creek, at its head, $4\frac{3}{4}$ miles up, at altitude 1100.

EPHRAIM BRANCH.

On the left of Little Goose creek, $4\frac{1}{8}$ miles up it: Altitude of mouth, 840.

WALL BRANCH.

On the right, $\frac{3}{4}$ mile up Ephraim branch.

On the right, $\frac{3}{8}$ mile up this branch, B. J. Finley has pits into the Manchester coal, said to be $2\frac{1}{2}$ to 3 feet thick, at altitude 980.

Ephraim branch forks, $\frac{1}{2}$ mile up it: On the left of the right fork, $\frac{1}{4}$ mile up it, by the road, is an old entry into the same bed, at altitude 980.

The bed is opened again in a pit at Linda Smallwood's, $\frac{1}{2}$ mile up, and in the right fork, with a foot of coal showing when visited, and probably $1\frac{1}{2}$ feet more coal which was covered with mud. Its altitude is 985.

HOOKER BRANCH.

On the left, $4\frac{3}{8}$ miles up Little Goose creek: Altitude of mouth, 845.

At M. V. Craft's, $\frac{3}{4}$ mile up Hooker branch, the Manchester coal, under 8 feet of shale, has been opened, 26 inches thick, at altitude 1015.

At Jasper Munsey's, $1\frac{3}{8}$ miles up Hooker branch, on the right, $\frac{1}{8}$ mile up a left branch, the same bed is opened in a 13-yard entry, under good shale roof, with 25 inches of coal at its mouth and face, at altitude 1015.

The principal bench of this vicinity lies 105 feet over this coal, at altitude 1120, and coal is reported at altitude 1175.

Hooker branch forks $1\frac{3}{4}$ miles up it; on the left nearly at its level, $\frac{1}{8}$ mile up the left fork, the Manchester bed is opened in a pit at altitude 995.

On the head of the right fork, $\frac{1}{4}$ mile up it, the bed has been opened at altitude 1010, with yellow shale 10 feet below it.

GRAY FORK.

On the right, $6\frac{1}{4}$ miles up Little Goose creek: Altitude of mouth, 870.

From the bed of this stream, $\frac{1}{8}$ mile up it, coal has been taken having a thickness of not more than $1\frac{1}{2}$ feet, if the rock at the bottom of the hole left is the limit of thickness of the coal bed and not a parting. The coal lies at altitude 875 about 185 feet below the Manchester bed, and is below drainage everywhere else on Goose creek waters. It has about a foot of hard black slate roof.

ROGERS BRANCH.

On the right, $\frac{1}{4}$ mile up Gray fork.

On the right, at U. S. Eagle's, $\frac{1}{4}$ mile up the branch, the Manchester bed has been opened, under shale, with about 27 inches of coal, at altitude 1070.

In the road, $\frac{3}{8}$ mile up Gray fork, is 6 inches of coal stain at altitude 900. Enclosed in sandstone it is quite likely not to be of a continuous bed.

On the right branch, $\frac{3}{4}$ mile up Gray fork, on the left, $\frac{1}{4}$ mile up the branch, George Thomas has a wet entry, under 5 feet of shale, with coal 29 inches thick at its mouth, and a second entry beside it with about 34 inches of coal. These are in the Manchester bed at altitude 1060.

TINKERS BRANCH.

On the right, 1 mile up Gray fork.

On the right, $\frac{1}{4}$ mile up the branch, Henry Hounschell has a long entry into the same bed, with 31 inches of coal, at altitude 1095. A private analysis of this coal, given as 30 inches thick, is reported with the following results:

Manchester Bed.	
Moisture	1.40
Volatile combustible matter	33.80
Fixed Carbon	59.00
Ash	5.80
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Sulphur	0.47

DRY BRANCH.

On the right, 2 miles up Gray fork.

On the right, $\frac{1}{4}$ mile up this branch, George Potter has an entry with the following section, the coal measured at the face, 12 yards in:

Manchester Bed.	
Sandstone	5 Feet.
Shale	10 Feet.
Coal . . . . .	.22"
Altitude, 1110.	

At the forks, 3 miles up Gray fork, the altitude is 990.

A quarter mile up the right fork is Wells branch on the right, and a mile up the branch is Wyatt's opening, on the left at the head of the branch. The coal here is 20 inches thick, under 8 feet of shale, at altitude 1240. Apparently this coal is somewhat over 100 feet above the Manchester bed, but there was nothing definite found in the vicinity to aid in fixing its position. It seems to correspond with thin coal found on Goose creek, $\frac{1}{8}$ mile above Collins fork.

KINKEAD BRANCH.

On the right, 7 miles up Little Goose creek: Altitude of mouth, 890.

On the right, $\frac{1}{4}$ mile up this branch, Mrs. Nancy J. Hibbard has a long entry into the Manchester bed, under good shale roof, with coal 32 inches thick 10 yards in. Its altitude is 1060.

A half-mile up to the Road fork, and $\frac{3}{4}$ mile up it, is a right branch. In this branch, $\frac{1}{4}$ mile up it, Hopper Bolling has pits 3 feet or more deep, with cannel coal reported 4 feet thick. Blocks of the cannel 10 inches thick were seen, apparently very good in quality, but said to be explosive. It also is of the Manchester bed at altitude 1060.

On the right, $1\frac{1}{2}$ miles up the Road fork, and at its level, is the Benge long entry with about 40 inches of coal, under a bad shale roof, at altitude 1110. Following is a section of the bed and analysis of the coal, not including the cannel, as obtained from a private source:

Manchester Bed.	
Coal	28"
Parting	1"
Coal	6"
Cannel coal	4"
Analysis.	
Moisture	2.10
Volatile combustible matter	35.45
Fixed carbon	57.21
Ash	5.24
<hr/>	
Sulphur	1.15

On the left of Little Goose creek, $7\frac{1}{4}$ miles up it, at Timothy Young's, on the left, $\frac{1}{8}$ mile up a left branch, an abandoned entry gives the Manchester coal about 28 inches thick, at altitude 990.

PHILPOT BRANCH.

On the left of Little Goose creek, 8 miles up it: Altitude of mouth, 910.

At the head of a left branch, $\frac{1}{8}$ mile up Philpot fork, and $\frac{1}{8}$ mile up the branch, R. T. Hayre has a 10-yard entry into the Manchester coal, 39 inches thick half way in, at altitude 1000. The roof is of sandstone, slightly shaly, showing 10 feet thick. In about 50 feet distance the coal rises southward nearly 10 feet; a continuous rise is not apparent.

On the right, one mile up the fork, at Urban Post-office, Thomas Hayre has two long entries, under 5 feet of shale, with coal 30 inches thick at the mouth of the one open to measurement. The roof, soft at the mouth, seems to be fairly hard inside. These entries are of the Manchester bed at altitude 1070, 130 feet above the fork.

On the left of a right branch, 2 miles up Philpot fork, $\frac{1}{4}$ mile up the branch, Granville Philpot has a long entry into the same bed, under shale, with 33 inches of coal at its mouth. The coal is said to vary in thickness from 30 to 36 inches. Its altitude is 1060, 80 feet above the fork.

On the left, $2\frac{1}{2}$ miles up the fork, on the road to main Little Goose creek, William Longworth has an entry into the same bed, under shale, with 37 inches of coal 8 yards in, 30 inches 12 yards in, and thence to the face, 35 yards in, 33 inches. It is 25 feet above the fork, at altitude 1045.

From a private report the following is given of coal on Minton branch doubtless of the same bed:

Coal ..	11"
Parting ..	2"
Coal ..	32"

Analysis.

Moisture	1.32
Volatile combustible matter	37.66
Fixed carbon	55.52
Ash	5.50
<hr/>	
Sulphur ..	100.00
	2.25

ROCK GAP BRANCH

On the left of Little Goose creek, 9 miles up it: Altitude of mouth, 950.

On the left, $\frac{1}{4}$ mile up the branch, Irvine Hoskins has an 8-yard entry into the Manchester coal 32 inches thick at the face. Upon it is 5 feet of shale and black shale lies 75 feet below it. Its altitude is 1075.

Mr. Hoskins has also an abandoned entry into the same bed on the right, $9\frac{1}{4}$ miles up Little Goose creek. Altitude not taken.

BROCK BRANCH.

On the left, $9\frac{3}{4}$ miles up Little Goose creek: Altitude of mouth, 980.

The Ponder abandoned entry, on the left $\frac{1}{4}$ mile up the branch, is said to have a maximum thickness of 36 to 38 inches.

The Fisher entry on the right, $\frac{3}{8}$ mile up, has 25 inches of coal at its face, 8 yards in.

A new Fisher stripping on the left, $\frac{1}{2}$ mile up, gives 31 inches of coal under 4 feet of shale.

These three openings are of the Manchester bed at altitude 1080.

On the right, by the road $10\frac{1}{4}$ miles up Little Goose creek, 10 feet above it, at altitude 1015, is 5 inches of coal under 5 feet of shaly and honeycomb sandstone and upon 5 feet of fire clay. This coal, not seen elsewhere, unless near the head of Horse creek, is probably in the place of the usual black shale 70 feet under the Manchester bed, and not continuous.

MANCHESTER.

The formation below the Manchester coal, which has been clearly apparent over much of the region from Beech creek to this point, here makes its last appearance with characteristic cliffs, though the topography above to Collins fork is somewhat indicative of it. The black shale which lies about 70 feet below its top, noted on Stone Coal branch, is cut out by sandstone in the town, its place apparently indicated by the flat upon which the principal stores are built, the courthouse being upon the top of the formation at altitude 909, 114 feet above Goose creek.

On the right, $\frac{1}{4}$ mile up the left branch, with mouth at the town ford, the Lucas heirs have a long entry into the Manchester bed with coal 27 inches thick at its mouth and altitude 885.

On the left of the town branch, opposite the Webb Hotel, J. A. Webb has an abandoned opening, said to have 2 feet of coal, at altitude 910.

Other openings on this branch show it to rise regularly to an abandoned one on the right, $\frac{3}{4}$ mile up, at altitude 930, with benches on the left, somewhat indistinct, where noted, 70 feet above the coal, but plain 100 feet above it.

At the upper end of Manchester, on the left, $\frac{1}{8}$ mile up a right branch of Goose creek, Peter Halsey has an entry into the Manchester bed, under shale, with 17 inches of coal at the face 6 yards in. Altitude 885.

TANYARD BRANCH.

On the left, $\frac{1}{4}$ mile above the center of Manchester: Altitude of mouth, 795.

On the right, $\frac{1}{4}$ mile up the branch, an old pit gives the altitude of the same bed 845.

HORSE CREEK.

On the right, $1\frac{1}{2}$ miles up Goose creek from Manchester: Altitude of mouth, 800.

MUDDY GAP BRANCH.

On the right of Horse creek, $\frac{1}{4}$ mile up it: Altitude of mouth, 805.

The Manchester bed lies above the sandstone which shows along the branch near its mouth, its altitude there being about 860.

At Samuel Howe's, on the right, $\frac{3}{4}$ mile up the branch, is a 45-yard entry under black shale, with 32 inches of coal 16 yards in. The entry rises rapidly northeastward. Its altitude at the mouth is 875.

On the right, 1 mile up the branch, a long entry under black shale gives the same bed, with 24 inches of coal at its mouth, at altitude 895.

On the left, 100 yards farther up, James Hyde has a long entry into the same bed, with 29 inches of coal 6 yards in, under shale, at altitude 880.

On the right, $1\frac{1}{4}$ miles up Horse creek, is a long entry into the Manchester bed, in the point of a hill, with 28 inches of coal 8 yards in, and altitude 845.

At William Horton's, $1\frac{7}{8}$ miles up the creek, on the right, $\frac{1}{8}$ mile up a right branch, a stripping gives the same bed, under 10 feet of shale, 39 inches of coal, at altitude 855.

CRAWFISH BRANCH.

On the left, 2 miles up Horse creek: Altitude of mouth, 820.

On the left, $\frac{1}{2}$ mile up the branch, 10 feet above it, an abandoned entry, gives the Manchester bed at altitude 860, while 100 yards farther up it has been opened at altitude 880.

This sharp rise is not continuous, however, for a mile up the branch a pit in it gives the bed at altitude 875.

At $1\frac{1}{2}$ miles up, on the right of a left hollow, a thin coal under brown and black shale has been opened at altitude 990, probably about 100 feet above the Manchester bed.

On the left, $2\frac{1}{2}$ miles up Horse creek, Moses Lewis has a stripping of the Manchester bed about 38 inches

thick, the lower half buried in mud when visited, but presumably all coal. Its altitude is 865.

On the right, $2\frac{5}{8}$ miles up, Daniel Sibert has a 5-yard entry into the same bed with 44 inches of coal at its mouth. Altitude, 860.

PAWPAW BRANCH.

On the right, $2\frac{3}{4}$ miles up Horse creek: Altitude of mouth, 830.

On the left, $\frac{1}{4}$ mile up the branch, Thomas Sibert has a long entry into the Manchester bed with coal 37, 39 and 36 inches thick at 5, 10 and 30 yards, respectively, from the mouth. Its altitude is 880.

YAGER BRANCH.

On the right, $\frac{1}{2}$ mile up Pawpaw branch. The Manchester bed has been opened by a pit in this branch, $\frac{3}{8}$ mile up it, at altitude 890.

On the right of Pawpaw branch, a mile up it, old entries give the same bed at altitude 920. It probably goes under the branch about $1\frac{1}{2}$ miles up.

On the left, $3\frac{1}{8}$ miles up Horse creek, Frank Garrison has a stripping of the Manchester bed with 29 inches of coal (in water) to hard bottom. The bed is said to be about 4 feet thick here, and the bottom measured to may have been coal not removed. Its altitude is 895.

HURD BRANCH.

On the right, $3\frac{1}{4}$ miles up Horse creek: Altitude of mouth, 850.

On the right, $\frac{1}{4}$ mile up the branch, and on the left of a right hollow, E. G. Hurd has an 80-yard entry into the Manchester bed, with 26 inches of coal 3 yards in, and altitude 900.

On the right, $\frac{3}{8}$ mile up the branch, is a long entry, nearly meeting the preceding, at altitude 910. Both are reported to have 29 inches of coal.

On the left of Horse creek, $3\frac{3}{8}$ miles up it, James Hensley has a long entry into the same bed with 40 inches of coal 3 yards in, at altitude 880.

In a left branch, $3\frac{1}{2}$ miles up Horse creek, are pits, $\frac{1}{8}$ mile up the branch, giving the same bed at altitude 890.

WEBB BRANCH.

On the right, $3\frac{3}{4}$ miles up the creek: Altitude of mouth, 865.

On the right, $\frac{1}{8}$ mile up the branch, Bates Shackelford has a 4-yard entry with Manchester coal 30 inches thick at its mouth, and altitude 930.

JOHNSON BRANCH.

On the right, $4\frac{1}{4}$ miles up Horse creek: Altitude of mouth, 885.

In the branch, $\frac{1}{2}$ mile up it, are pits giving the following, approximately:

Manchester Bed.	
Shale.	
Coal	5"
Clay	2"
Coal	24"
Altitude, 955.	

The upper seam of coal was not exposed to measurement and the lower seam was in water. Probably the parting would run out under good cover.

HOUSE BRANCH.

On the right, $4\frac{3}{4}$ miles up Horse creek: Altitude of mouth, 900.

On the right, $\frac{1}{8}$ mile up the branch, on the right of a right hollow, Mrs. Alice Brown has a long entry into the Manchester bed with 24 inches of coal at its mouth and altitude 935. Ten feet of shale lie on the coal, the lower foot black. Sandstone shows one foot below the coal.

On the right, $\frac{1}{2}$ mile up the branch, the same bed has been opened at altitude 950.

On the left, $\frac{3}{4}$ mile up the branch, and again on the left, 100 yards farther up, the same bed has been opened

by Washington Owens and James Brown, respectively, with the following sections:

Owens.		Brown.	
	Feet.		Feet.
Yellow shale	5 0"	Yellow shale	7 0"
Black shale	3 0"	Brown shale	1 0"
Coal	12"	Coal	4"
Shale	6"	Shale	3"
Coal	26"	Coal	21"
Fire clay	1½ to 2	Fire clay	1½ to 2
Altitude, 980.		Altitude, 1000.	

The Owens entry is given above as measured 3 yards in. At the face, 18 yards in, the bottom coal is 4 inches or more thicker. The Brown entry is given as measured at its mouth.

The two entries, seen from across the branch at different heights, appear to be in different seams of coal, but the similarity of sections proves them to be of one seam only.

On the right, 5 miles up Horse creek, in J. C. Brown's springhouse, is 14 inches of coal under 10 feet of shaly and thin-bedded sandstone at altitude 935. This is possibly of the Manchester bed, though it is probably in the place of the usual black shale 70 feet below that coal. In the latter case the Manchester bed lies on the broad bench 70 feet above the coal in the springhouse, and this bench can be traced, apparently, nearly to the coal mentioned next.

The Manchester bed shows as a stain in the road 6¼ miles up the creek, at altitude 985. Fifteen feet of shale, much of it black, lie over the coal and fifteen feet lie under it. Twenty-five feet under is the top of the hard sandstone only one foot below the coal at Mrs. Brown's on House branch.

The same bed shows again on the right of the creek and road, 6½ miles up, at altitude 1000.

PIGEON ROOST BRANCH.

On the right, 6¾ miles up Horse creek: Altitude of mouth, 950.

At the forks, ¾ mile up this branch, altitude 1000, the Manchester coal lies about 20 feet higher, on top

of the sandstone cliffs which are conspicuous along the branch.

An eighth-mile up the right fork, on the right, ¼ mile up a right branch, Mrs. Reed has a long entry into the Manchester bed, with 30 inches of coal at its mouth and 12 yards in, though the entry is in a roll. The 10 feet of cross-bedded sandstone on the coal is furrowed underneath, the furrows 6 inches deep, filled with sandstone, which give a smooth top to the coal, but, coming down where the coal is removed, give a waving under-surface to the remaining sandstone. A foot or more of fire-clay underlies the coal, and sandstone is below that, as on House branch. The altitude of the entry is 1015.

In the left fork, ¼ mile up it, at altitude 1010, shale is exposed with a southwest dip of possibly 10 per cent, where, normally, it appears that nearly level sandstone should be. Nothing else seen in the vicinity except the roll in the Reed entry is indicative of any irregularity of the measures.

On the left, ½ mile up the left fork, James Bailey has a long entry with the following exhibit, the coal measured 2 yards in:

Manchester Bed.

Shale	3	Feet.
Smooth clay sandstone	2	Feet.
Black shale	1	Foot.
Coal	28"	
Altitude, 1035.		

From the mouth of Pigeon Roost branch westward to the top of the hill on the London road the following section was obtained:

	Thickness.		Altitude.
	Feet.	Inches.	
Summit			1220
Sandstone	65		1155
Covered	10		
Shaly sandstone	10		1135
Shale	10		1125
Shale or coal	2		
Coal stain		6	1120
Shale	15		1105

Probably sandstone	10	1095
Shale	30	1065
Mostly sandstone	45	1020
Covered	35	
Iron ore	3	985
Dark shale	10	975
Covered (Manchester coal)	5	970
Mostly shale (to creek)	20	950

The 15 feet of shale at altitude 1105, weathering rapidly, leaves a prominent bench which, if correctly traced, is at altitude 1055, $7\frac{3}{4}$ miles up the creek, giving a dip of strata southwest amounting to something like $2\frac{1}{2}$ per cent. Shales in the creek at the latter point confirm this.

Following are private analyses of coal of the Manchester bed from Horse creek waters, thickness of coal being given, but location not definitely stated:

Inches of coal	30	40	43	27
Moisture	1.95	2.15	1.60	1.55
Volatile combustible matter..	35.75	35.52	36.80	36.21
Fixed carbon	57.14	58.33	56.70	58.64
Ash	5.16	4.00	4.90	3.60
	100.00	100.00	100.00	100.00
Sulphur	1.01	0.94	1.18	0.82

On the left of Goose creek, about $2\frac{1}{2}$ miles above Manchester, a Garrard mine gave 31 inches of coal 70 yards in. My sample from this point, analyzed by Dr. Peter, gave:

Manchester Bed—Chem. Report No. 2648.

Moisture	1.20
Volatile combustible matter	38.10
Fixed carbon	54.90
Ash	5.80
	100.00
Sulphur	1.793
Coke (spongy)	60.70
Specific gravity	1.287

“A pure-looking pitch-black coal with very little fibrous coal and only a few specks of pyrites.”

COLLINS FORK.

On the right of Goose creek, $2\frac{1}{2}$ miles above Manchester: Altitude of mouth, 800.

On the right of Collins fork, $\frac{1}{4}$ mile up it, is the old Garrard mine, with coal hidden by gob to about $\frac{1}{4}$ mile in, where it is 35 inches thick; by former reports varying from 12 to 44 inches. Its altitude is 819.

Following is a private analysis of coal from this mine, where the coal is given as 36 inches thick:

Manchester Bed.

Moisture	1.60
Volatile combustible matter	37.30
Fixed carbon	58.16
Ash	2.94
	100.00
Sulphur	0.90

On the right, 1 mile up Collins fork, at the mouth of Engine branch and by the road, the Manchester coal was struck in a shaft reported 12 feet deep, making the altitude of the bed about 815. At this point the following section was obtained:

	Altitude.
Springs on shale	965
Bench (not distinct)	950
Bench (on 20 feet S. S.)	905
Black shale (2 to 3 feet)	
Fire-clay (1 foot)	865
Shale (10 feet)	855
Shaly sandstone	835
Road at shaft	815
Goose creek	805

The bench 100 feet over the coal is especially to be noted here, and the replacement by shale and shaly sandstone of hard sandstones below it seen farther down the creek. This is still more noticeable on Goose creek above Collins fork.

On a left branch, $1\frac{3}{4}$ miles up Collins fork, on the right, $\frac{3}{8}$ mile up the branch, an old prospect shows what may possibly be 3 feet of coal or coal and partings, under 8 feet of shaly and thin-bedded sandstone, at altitude 1015. This is of the Howard bed, apparently about 240 feet above the Manchester coal.

A bench opposite the mouth of Buzzard creek, at altitude 880, marks the altitude of the Manchester bed there at about 780, or 35 feet below creek level. An old report gives it as 52 feet (below bottom land level).

BUZZARD CREEK.

On the left, $2\frac{1}{4}$ miles up Collins fork: Altitude of mouth, 815.

The light pitch of strata up Collins fork increases as the direction becomes more easterly along the lower part of Buzzard creek, the cliff sandstone forming the bench 100 feet above the Manchester coal going below drainage $\frac{3}{4}$ mile up the creek, at altitude 820.

FURNACE BRANCH (OR LITTLE BUZZARD CREEK).

On the left, $1\frac{3}{8}$ miles up Collins fork: Altitude of mouth, 830.

On the left, at the head of this stream, Claiborne McCreary has openings into the Whitesburg and Fire-clay coals, the former a prospect and the latter an 8-yard entry, measured half-way in. These openings give:

Whitesburg Bed.			Fire-clay Coal.		
Altitude, 1200.			Altitude, 1300.		
	Feet.	In.		Feet.	In.
Dark shale	8	0	Hard sandstone	12	0
Coal		2	Shale	2	0
Black shale		2	Coal		2
Coal		18	Shale		1
			Coal		3
			Shale		1
			Coal		9
			Clay		1
			Coal		15

These correlations are based on an entry at altitude 890 into the Howard bed on Schoolhouse branch of main Goose creek. Reported coal at altitude 1020 in a well at Mr. McCreary's house is of the thin bed 100 feet above the Howard bed. A rise of strata from the house $\frac{1}{8}$ mile southeast to the Whitesburg opening and sharper rise to that of the Fire-clay coal, 100 yards beyond, is indicated.

SAPLING BRANCH.

On the left, $1\frac{1}{2}$ miles up Collins fork: Altitude of mouth, 830.

On the right, $\frac{1}{4}$ mile up this branch, the Howard coal is exposed at altitude 970. In former times the bed was mined to some extent in this vicinity, the coal having been used in evaporating brine.

SWAFFORD BRANCH.

On the left, $2\frac{1}{2}$ miles up Collins fork: Altitude of mouth, 860.

On the left, $2\frac{1}{2}$ miles up this branch, Thomas Swafford (late Isaac) has an entry into the Howard bed, with coal 31 inches thick at its mouth and 30 inches 20 yards in. In the point of the hill 100 yards beyond, an abandoned entry of the same bed gave 36 inches of coal under 20 feet of shale with lime boulders. Directly under this is 3 feet of shale, coal and shale 9 inches and then 16 inches of coal, showing that the bed is split here as is the case on Otter creek and elsewhere. The altitude of the entry is 975.

On the left, $1\frac{3}{4}$ miles up the branch, the lower(?) seam, probably thin, has been opened at altitude 990.

On the right, 2 miles up, 15 inches of coal under 4 feet of rough sandstone is opened at altitude 1035. This appears to be the upper seam of the same bed, with sandstone roof instead of its usual shale.

A bench on massive sandstone above this coal, at altitude 1205, is said to carry about 2 feet of coal (the Whitesburg bed?), while a 40 foot cliff cresting the hill-top at altitude 1530 lies between the Haddix and Hazard beds.

On the left, $2\frac{3}{4}$ miles up Buzzard creek, 10 feet above it, is 6 inches of coal on one foot of fire-clay and between massive sandstones. This coal at altitude 885 goes under Buzzard creek near the mouth of Service branch, showing a very slight rise up the creek. It is doubtless 100 feet above the Manchester bed.

SARVIS BRANCH.

On the left, $4\frac{1}{2}$ miles up Buzzard creek: Altitude of mouth, 910.

On the left at Martin Smith's, 1 mile up and 20 feet above the branch, coal and black shale on sandstone indicate the upper seam of the Howard bed at altitude 1060.

On the right, at the same place, a wet entry, under shale, with $2\frac{1}{2}$ feet of coal or coal with partings, is at altitude 1435. Cliffs crest the hills some 80 to 100 feet higher. This coal is probably of the Haddix bed.

On the left by the branch, $1\frac{1}{2}$ miles up it, is 14 inches of coal of the Whitesburg bed in sandstone at altitude 1195.

On the left, $1\frac{3}{4}$ miles up the branch, 100 yards from the gap to Otter creek, Mrs. Margaret Swafford has a 2-yard entry, under 15 feet of sandstone, the lower half of which is somewhat shaly. The coal is 28 inches thick with a 1-inch parting 8 inches from the bottom. Its altitude is 1420, and the cliff capping the ridge is about 60 feet higher. This bed is evidently the same as that just recited at altitude 1435 as of the Haddix bed. It is (by barometer) 220 feet above the adjacent Fire-clay coal opening on Otter creek.

RUSSELL BRANCH.

On the left, $4\frac{3}{4}$ miles up Buzzard creek: Altitude of mouth, 930.

Coal at the mouth of this branch 5 inches thick appears to be of the same bed as that noted 10 feet above Buzzard creek, 3 miles up it, although here 30 feet of shale is exposed above it, while down the creek the bed is enclosed in massive sandstone. If the same, there is a rise of strata up the creek amounting to 55 feet in the

$1\frac{3}{4}$ miles, whereas above and below these points the strata dip slightly up-stream.

On the left, $\frac{3}{4}$ mile up the branch, 20 feet about it, B. T. McCreary has an abandoned timbered prospect with a foot or two of coal at altitude 1040, about the horizon of the Howard coal.

On the right of a left hollow at the head of the branch, a mile up, he has an abandoned entry showing in the dump bituminous, splint and cannel coal. The entry, at altitude 1400, is on top of 30 feet of massive sandstone forming a cliff and 3 feet under shaly sandstone, 5 feet exposed. No cliff sandstone shows in the hill above, which is but about 70 feet higher. This indicates the coal as of the Hazard bed, but, as that bed is not known to have cannel elsewhere and its altitude is indicative of the Haddix, it is referred to that bed.

On the left, $6\frac{3}{4}$ miles up Buzzard creek, at its head, 150 yards from the gap to Horn branch, John Root has two entries into what is probably the Fire-clay coal. One of the entries is in a roll, but both have 34 inches of bottom coal and a fairly good shale roof. At 8 yards in, one of them has the following bed section:

Shale	15 Feet.
Coal	3"
Shale	1"
Coal	1"
Shale	2"
Coal	34"
Fire-clay	2 Feet.
Altitude, 1295.	

The gap to Horn branch is but 60 feet higher, and the area of coal available is hardly sufficient to overcome the difficulty of transportation to railroad level.

JOE NASH BRANCH.

On the left of Collins fork, 4 miles up it: Altitude of ford about mouth of branch, 824.

James Adams formerly had an opening on the left, $\frac{1}{4}$ mile up this branch, which gave the following section:

Shale	5 Feet.
Coal	9"
Shale	6"
Coal	24"
Altitude, 930.	

This appears to be of the bed 100 feet above the Manchester coal.

AERY (OR AYRES) BRANCH.

On the right of Collins fork, $4\frac{1}{4}$ miles up it: Altitude of mouth, 825.

On the left, a half-mile up this branch, 9 inches of splint coal lies under 21 inches of black slate and 5 feet of shale, at altitude 930.

OLD STABLE BRANCH.

On the left, $4\frac{3}{4}$ miles up Collins fork: Altitude of mouth 830.

Old openings, $\frac{1}{2}$ mile up this branch, at J. C. White's formerly L. A. Byron's, gave the following:

Altitude, 930.	Altitude, 1040.
Shaly sandstone.	Shaly sandstone . . . 15 Feet.
Dark shale 3 Feet.	Shale 3 Feet.
Coal 10"	Coal 18"
	Shale 17"
	Coal and shale . . . 12"
	Coal 3"
	Shale 3"
	Coal 12"

INGRAM (COTTONGILL) BRANCH.

On the left, 5 miles up Collins fork: Altitude of mouth, 830.

A quarter mile up this branch on old opening gave 20 inches of coal, under 5 feet of dark shale, at altitude 925. From $1\frac{1}{2}$ to 2 miles up the branch the following sections were obtained:

Sandstone	15 Feet.
Coal	12"
Clay	1 Foot.
Sandstone	8 Feet.
Altitude, 1265.	

Massive sandstone . . .	20 Feet.
Dark shale	5 Feet.
Coal	10"
Clay	6"
Shale	2 Feet.
Sandstone	20 Feet.
Altitude, 1120.	

Sandstone	4 Feet.
Black slate	5"
Shale	12"
Coal	22"
Altitude, 1005.	

Shale and shaly sandstone	30 Feet.
Black shale	1 Foot.
Coal	15"
Shale to the branch, $1\frac{1}{2}$ miles up it.	
	3 Feet.
Altitude, 915.	

The coals at altitudes 930 and 915 on the three preceding branches show that the strata lie almost level there, the bed next above, at altitudes 1040 and 1005, indicating a slight southeasterly dip. The latter are of the Howard bed, and as the Manchester bed is about 250 feet lower, it must be within 50 feet of the bed of Collins fork, and may possibly be found above it in the westerly bend of the fork above Aery branch. Its covering shales show at the ford below.

The 12 inches coal at altitude 1265 seems to represent the rider to the Fire-clay coal.

At John L. Cottengim's, 6 miles up Collins fork, on the right, $\frac{1}{8}$ mile up the hollow on the right behind his house, an old opening gives the following:

Haddix Bed.	
Shale	3 Feet.
Thin bedded sandstone	1 Foot.
Coal	9"
Shale	3 Feet.
Coal (reported)	18 to 22"
Altitude, 995.	

A thick hard sandstone lies close below the coal.

WHITE'S CREEK.

On the right, $6\frac{1}{8}$ miles up Collins fork: Altitude of mouth, 840.

A half-mile up this creek the cliffs show the change in going westward remarked elsewhere, from sandstones to shales, the cliffs in this case being probably 100 to 200 feet above the Manchester coal.

The only coal reported opened on the creek is at Jack Collins', 2 miles up. Here, on the right, is 10 inches of coal, under shale, at altitude 960, fifteen feet above the creek. On the left a stripping gives the following:

Black slate	3	Feet.
Sandstone	2	Feet.
Coal	5"	
Shale	1"	
Coal	1"	
Shale	7	Feet.
Altitude, 960.		

It appears likely that this is of the bed 100 feet above the Manchester bed.

COLD SPRING BRANCH.

On the left, $7\frac{1}{2}$ miles up Collins fork: Altitude of mouth, 849.

A quarter-mile up to the forks of this branch, and on the left, $\frac{1}{4}$ mile up the left fork, is the following:

Howard Bed.

Massive sandstone	5	Feet.
Black slate	2"	
Coal	19 to 22"	
Massive sandstone	5	Feet.

Sandstones occupy most of the 145 feet from the creek to this coal and most of the next 80 feet above it. Strata lie nearly level along the creek, but on the branch they show an east or northeasterly dip.

On a left branch, $9\frac{3}{4}$ miles up Collins fork, $\frac{1}{4}$ mile up the branch, on the right, $\frac{1}{8}$ mile up a right branch,

the same bed or a lower split from it, has 18 inches of coal, under 3 feet of shaly and massive sandstone, at altitude 980.

DISAPPOINTMENT BRANCH.

On the left, 10 miles up Collins fork: Altitude of mouth, 855.

On the right, $\frac{1}{2}$ mile up the branch, John Riley has, in the point of the hill on the right by his house, a coal stain at altitude 950, and 65 feet higher, $\frac{1}{8}$ mile up a right hollow there, the following:

Howard Bed.

Shale.	
Massive sandstone	4 Feet.
Coal	24"
Black slate.	
Altitude, 1015.	

The lower coal is probably the lower split of the Howard bed, possibly a part of the interval between them being due to a surface slip.

A half-mile up the left fork from Riley's, and in a left branch, $\frac{1}{8}$ mile up it, Charles Knuckles has a pit with coal, in water, probably 24 inches thick, under 2 feet of shaly sandstone, probably the lower split of the Howard bed. Its altitude is 990.

Up the right fork from Riley's the pitch of strata is southwesterly. At Jefferson Frost's, on the right, at the head, $1\frac{1}{2}$ miles up, is the following, the bed section measured 10 yards into a long entry:

Shale	8	Feet.
Coal	2"	
Shale	7"	
Coal	1"	
Shale	1"	
Coal	25"	
Altitude, 1320.		

This opening is so like those of John Root's at the head of Buzzard creek as to admit of no doubt of their correlation, but proof is not complete that they are of the Fire-clay coal bed.

WELLS BRANCH.

On the left, $11\frac{1}{4}$ miles up Collins fork: Altitude of mouth, 880.

Under a fall in the branch, $\frac{1}{4}$ mile up it, the Howard bed has 23 inches of coal under 10 feet of sandstone, and with 6 inches of shale between it and the fire-clay floor. Its altitude is 955.

On the right, $\frac{1}{2}$ mile up the branch, an unfinished prospect, shows a considerable amount of squeezed coal under broken shale at altitude 1490. This is probably of the Hazard bed, too high in the hill to be of any value, but indicating a considerable area of the Fire-clay coal below available for delivery to Collins fork.

BULL CREEK.

On the right, $11\frac{3}{4}$ miles up Collins fork: Altitude of mouth, 860.

Following is a section taken at Mrs. Hopper's, near the mouth of this creek, reproduced from a former report, with altitudes corrected:

Black slate.	
Coal	2"
Clay.	
Altitude, 1130.	
Sandstone	20 Feet.
Black slate	4"
Clay	15"
Coal	12"
Clay.	
Altitude, 1020.	
Sandstone	45 Feet.
Black slate	3 Feet.
Cannel coal	26"
Sandstone	10 Feet.
Altitude, 950.	
Sandstone	5 Feet.
Coal ..	11"
Shale	10 Feet.
Altitude, 895.	
Creek, 860.	

TURKEY BRANCH.

On the left, $11\frac{1}{4}$ miles up Bull creek.

On the right, $\frac{1}{2}$ mile up this branch, Wade Swafford has an entry into the Howard coal 24 inches thick, under 7 feet of shale, the lower foot dark, and with black slate floor. Its altitude is 1070. The coal is said to be 36 inches thick in an abandoned entry across the branch.

At about 2 miles up Bull creek, T. Jones has the cannel bed 26 inches thick, under 3 feet of shale, at altitude 990. The splinty cannel is 15 inches thick here, and at the bottom of the bed is block bituminous coal 7 inches thick. The intermediate 4 inches is bituminous coal with lime concretions varying up to 3 inches in thickness.

UPPER TURKEY BRANCH.

On the left, $13\frac{1}{4}$ miles up Bull creek.

On the right, $11\frac{1}{4}$ miles up the branch, Theophilus Hacker has an abandoned entry into the Howard bed with the following section, as obtained 2 yards in:

Shaly sandstone .	3 Feet.
Black slate	6"
Coal	12"
Shale	9"
Coal	4"
Altitude, 1150.	

The Swafford and Hacker entries mark a change of strata from comparatively hard sandstones below to softer sandstones and shales above them. The pitch of strata as shown by their altitudes probably brings that bed to altitude 1020 at the mouth of Bull creek, and the Manchester should lie about 100 feet below drainage there. The cannel bed appears to be not constant.

At $12\frac{1}{8}$ miles up Collins fork the following section shows on the right in the road:

Coal stain.	
Yellow shale	10 Feet.
Dark shale	5 Feet.
Coal	1 Foot.
Shaly sandstone	5 Feet.
Altitude, 880.	

Above these shales sandstones prevail, but with a much larger proportion of shales than on Bull creek. The slight up-stream dip of strata in evidence throughout most of Collins fork continues nearly to its head, the top of the sandstone under the Howard coal at 14 miles up the fork being at altitude about 950. Thence to the head the rise appears to be somewhat rapid.

No coal openings were found above Hammond fork, on Collins, but, across the divide, on the head of Little Richland Creek, Eli Mills has the following, at the face of a 5-yard entry:

Howard Bed (?).

Shale	2 Feet.
Coal	6"
Shale	4"
Coal	6"
Shale	3"
Coal	4"
Altitude, 1100.	

HAMMOND FORK.

On the left, 12 miles up Collins fork: Altitude of mouth, 860.

This creek lies for most of its length in a syncline with rather rapid rise of strata on the north. No coal is opened on it below Horn branch.

While correlations of coal on this fork and its branches are given with a considerable degree of confidence, they are still left open to correction. The main evidence for the correlations adopted lies in the split bed, believed to be the Howard, found near the base of the hills at several points.

HORN BRANCH.

On the left, 2 miles up Hammond fork: Altitude of mouth, 880.

Opposite the mouth of a left branch, at John A. Riley's house, 1 mile up Horn branch, is a cliff 20 feet high, with top at altitude 930. An eighth mile up this left branch, and $\frac{1}{8}$ mile up its left fork, the top of the

sandstone, with 6 inches of coal upon it, is at altitude 960, giving a northwest rise of about $2\frac{1}{2}\%$.

Continuing up this left fork to $\frac{1}{4}$ mile up it, and thence $\frac{1}{8}$ mile up a left branch to two entries at its head, where the following section was obtained, the coal measured in each 5 yards in:

Fire-clay Coal.

Shale	2 Feet
Shaly sandstone	2 Feet.
Coal	3"
Shale	3"
Coal	1"
Shale	1"
Coal	34"

Altitude, 1260.

The same thin coal, 5 inches, between shaly sandstones, shows $\frac{1}{8}$ mile up the right fork, at altitude 980.

At $\frac{1}{4}$ mile up the right fork, on the right, $\frac{1}{4}$ mile up a left hollow, John A. Riley has a long entry measured 33 yards in with the following results:

Fire-clay Coal.

Black shale	1½ Feet.
Coal	3"
Shale with coal	3"
Coal	35"

Altitude, 1275.

As with the coal of the same bed on the head of Buzzard creek, the area here is small. The graded road up to the entry shows almost continuously thin-bedded and shaly sandstones.

At Fielding Hammond's, on the left, 2 miles up Horn branch, 15 feet above it, an old opening is said to have given 18 inches of coal. This appears to be the upper seam of the Howard coal, risen from the branch $\frac{1}{4}$ mile below. At $2\frac{1}{4}$ miles up the branch the lower seam shows, on 10 feet of massive sandstone, at altitude 985. This rapid rise of strata continues beyond probably only so far as to carry these seams over an anticline and to about 300 feet below the Root coal on the head of Buzzard creek.

SHOP BRANCH.

On the right, $4\frac{1}{2}$ miles up Hammond fork: Altitude of mouth, 910.

On the left, $\frac{1}{4}$ mile up the branch, the two thin coals of the Howard bed appear as follows:

Coal	15"	
Covered	10	Feet.
Shale	10	Feet.
Coal	19"	
Altitude, 960.		

Passing a thin stain in sandstone in the road, $\frac{3}{4}$ mile up the branch, at altitude 1035, and the gap to Mill (or Cole) creek at altitude 1130, southwest from the latter $\frac{1}{8}$ mile is the following:

Fire-clay Coal.

Shaly sandstone	5	Feet.
Coal	1"	
Shale	6"	
Coal	15"	
Shale	1	Foot.
Coal	6"	
Altitude, 1200.		

A 3-yard entry is driven into the 16 inches of coal. the 6 inches at the bottom apparently unknown until found by the writer.

An old entry on the right, $4\frac{3}{4}$ miles up Hammond fork, gives the lower of the Howard seams with 17 inches of coal, under 10 feet of shaly sandstone, at altitude 945, 30 feet above the creek.

On the left, 5 miles up the fork, the two seams of the same bed show as in the following section:

Howard Bed.

Massive and shaly sandstone	10	Feet.
Coal	10"	
Fire clay.		
Shaly sandstone	15	Feet.
Coal		
Shaly sandstone	10	Feet.
Altitude, 945.		

Fern impressions are abundant in the roof of one of these seams.

GARLAND BRANCH.

On the left, $5\frac{1}{2}$ miles up Hammond fork: Altitude of mouth, 930.

The upper seam of the same bed has been opened on both sides of this branch, beside the road up Hammond fork. On the right, under shelly sandstone, are 20 inches of coal, with a shale parting 2 inches thick 5 inches from the bottom. Its altitude is 950.

On the left, at David Smith's, $1\frac{1}{2}$ miles up the branch, and on the right, $\frac{1}{4}$ mile up the right branch there, the following coals were found:

Altitude, 1005.		Altitude, 1175.	
Shaly sandstone	7 Feet.	Sandstone	2 Feet.
Coal	4"	Shale	6 Feet.
Shale	18"	Coal	1"
Coal	4"	Shale	5"
Shaly sandstone		Coal	14"

The lower bed, 5 feet above the creek, is probably the same as the 6 inches coal found under the Riley coal on Horn branch. The upper is probably of the Whitesburg bed.

At the forks of Hammond fork, 6 miles up it, the altitude is 940.

LEFT FORK.

On the right, $\frac{1}{4}$ mile up this fork, is 5 inches of coal, under 30 feet of dark shale, at altitude 965. It lies on massive sandstone in the stream, under which is the Howard bed, at altitudes probably about 945 and 930.

An eighth-mile to the left from the above, Nelson Smith has a 25-yard entry with a rather strong southeasterly dip. Its bed section, 5 yards in, follows:

Fire-clay Coal.

Sandy shale	10	Feet.
Coal	1"	
Shale	9"	
Coal	30"	
Altitude, 1250		

The main seam is somewhat slaty in the middle. It is about 30 feet above a bench and 70 feet below a small cliff.

On the left, $\frac{1}{2}$ mile up the left fork, James Smith has an entry into the same bed, under shale, with 29 inches of coal, all good, at altitude 1255.

On the left, at the head of the left fork, $1\frac{1}{2}$ miles up it, Jabez Smith has entries into two beds, the lower measured at its mouth as given below, and the upper, closed, is given as reported:

Shaly sandstone	15	Feet.
Coal	7"	
Shale	11"	
Coal	35"	
Altitude, 1355.		

Shale	6	Feet.
Coal	1"	
Shale	14"	
Coal	21"	
Altitude, 1270.		

The lower bed seems to be at the right level for the Fire-clay coal, but in that case the Haddix bed is nearer to it than has been found elsewhere. The upper opening may be of the Fire-clay coal and the lower of the Whitesburg.

RIGHT FORK—HI SMITH BRANCH.

On the right, $\frac{1}{8}$ mile up the right fork: Altitude of mouth, 945.

On the right, $\frac{3}{4}$ mile up this branch, is an entry with the following section, as measured at the face, 12 yards in:

Haddix Bed.		
Sandstone	5	Feet.
Shale	5	Feet.
Coal	1"	
Shale	3"	
Coal	1"	
Shale	2"	
Coal	36"	
Altitude, 1340.		

UPPER GOOSE CREEK.

On the right at the ford, $\frac{1}{8}$ mile above Collins fork, $2\frac{5}{8}$ miles above Manchester, the Manchester coal, 29 inches thick, under 8 feet of black shale, and on 3 feet of brown shale, lies at altitude 805, 3 feet above low water level.

On the left, $3\frac{1}{8}$ miles above Manchester, behind the Joseph Jones house, a thin coal, said to be about 18 inches, between thick shales, lies at altitude 915. This is of the bed about 100 feet above the Manchester coal.

On the left, $3\frac{1}{4}$ miles above Manchester, Jeremiah Smith struck the stain of the Howard bed in digging a posthole, at altitude 1055. This gives the best opportunity found for determining the interval from it to the Manchester bed, which has just been noted at a point $\frac{3}{4}$ miles west at altitude 805. There is a slight up-stream dip here, but apparently none on an east-west line, and the Jones coal opening, about 100 feet above the Manchester bed, serves as additional evidence of nearly level strata on that line. The interval is, therefore, very near to 250 feet.

A quarter-mile to the left, $3\frac{1}{2}$ miles above Manchester, Mr. Smith has an opening into 25 inches of coal under 3 feet of shale, at altitude 1130. The bench of the Howard coal below it is at altitude 1030, the coal itself probably a little higher.

SHOP-BOTTOM BRANCH.

On the right, 4 miles above Manchester: Altitude of mouth, 810.

On the left, $\frac{3}{4}$ mile up the branch, Henry Clay has an abandoned entry into the Howard bed, giving at its mouth 22 inches of coal, with 3 inches shale parting 4 inches from the bottom, and 8 feet of shale covering. Its altitude is 1030.

LOCKHART CREEK.

On the left, $4\frac{1}{2}$ miles above Manchester: Altitude of mouth, 815.

On a left branch, 2 miles up the creek, at Beverley White's, on the left of the branch, $\frac{1}{4}$ mile up it, a pit shows 18 inches of coal under 2 feet of black slate and of shale on that, at altitude 1035. This is of the Howard bed, but black slate is an unusual roof for it.

On the right, $2\frac{1}{2}$ miles up, is 18 inches of coal in thick shales, at altitude 935, fifteen feet above the creek. The Manchester bed is 100 feet below this coal.

On the left of the road gap, $\frac{1}{4}$ mile above Lockhart creek, an old Howard bed opening lies at altitude 1015, and $\frac{1}{4}$ mile farther up, at altitude 980.

An eighth-mile farther, $5\frac{1}{2}$ miles from Manchester, the following section was obtained:

	Feet.	Altitude.
Bench		995
Sandstone cliff	15	980
Shales	30	835
Thin slipped coal		835
Creek		825

At $5\frac{3}{4}$ miles up (50 yards above Free Hollow) the slipped coal from 100 feet above the Manchester bed appears again in the road at altitude 845, and 175 feet below the Howard bed bench.

From this point the dip is rapid to the house of the White heirs (formerly Mrs. S. R. White), 6 miles from Manchester, whence a line of openings and strippings fall, in less than a quarter mile, from altitude 980 to 925. Following is the bed-section at one of the entries and an analysis by Dr. Peter of my sample, omitting the bottom 4 inches, from 7 yards underground:

Howard Bed.

Shale.	
Coal	2"
Shale	1"
Coal	22"
Shale	5"
Coal	16"

Analysis.

Chemical Report No. 2649.

Moisture	1.48
Volatile combustible matter	35.92
Fixed carbon	54.70
Ash	7.90
	100.00
Sulphur	0.885
Coke (spongy)	62.60
Specific gravity ..	1.278

From these openings to Rocky branch the bed is conspicuous in and along the road at numerous points, its covering where noted being 5 feet of shale under 3 feet of thin-bedded sandstone, and beneath the coal 10 feet of hard sandstone on 30 feet of softer sandstone or shale.

ROCKY BRANCH.

On the left, $7\frac{1}{2}$ miles from Manchester: Altitude of mouth, 825.

On the left, $\frac{1}{2}$ mile up the branch, E. C. Howard has an 8-yard entry from which the Howard bed derives the name here given it. Half way in the entry it has the following bed-section:

Howard Bed.

Shale	2 Feet.
Coal	2"
Shale	1"
Coal	3"
Shale	1"
Coal	16"
Shale	5"
Coal	16"

Altitude, 895.

GRANNY BRANCH.

On the left, $7\frac{3}{4}$ miles from Manchester: Altitude of mouth, 825.

A quarter-mile up this branch, on the left, $\frac{1}{8}$ mile up a left hollow, J. B. Walker has a long entry into the

Howard bed at altitude 890, with the following bed-section and analysis of the coal, the latter from my sample excluding the upper 2 inches:

Howard Bed.

Sandy Shale	8 Feet.
Coal	2"
Shale	2"
Coal	3"
Knife-edge parting.	
Coal	18"
Shale	8"
Coal	16"
Black slate.	

Analysis.

Lab. No. 3583.	
Moisture	1.60
Volatile combustible matter	39.25
Fixed carbon	55.25
Ash	3.90
	100.00
Sulphur	1.33
Coke, cellular, brittle	59.15

The lower parting varies from 5 to 10 inches in thickness.

BILLY BRANCH.

On the left, 8 miles from Manchester: Altitude of mouth, 825.

A stain of the Howard bed is exposed in the road on the projecting spur at the mouth of this branch, at altitude 890. Two feet below the stain is 4 inches of iron ore on a hard sandstone forming a cliff quite down to Goose creek.

From the branch, $1\frac{1}{4}$ miles up it, coal from this bed has been taken at altitude 900, and, possibly, a higher seam of the same shows in the bank on the left just above.

At $1\frac{1}{2}$ miles up, a pit in the branch is reported to have 18 inches of coal. Its altitude is 920. At the forks, $1\frac{3}{4}$ miles up, the bed is below drainage.

On the left, $\frac{1}{2}$ mile up the right fork, a considerable stripping, abandoned, indicates moderate thickness only of coal, all covered except its top. Ten feet of clay shale overlie it and a hard sandstone cliff shows about 50 feet above it. It is of the Whitesburg bed at altitude 1080.

On the right of a left hollow, $\frac{3}{4}$ mile up the right fork, $\frac{1}{4}$ mile up the hollow, James Wages has two entries, 50 yards apart, the lower giving the following at its mouth:

Fire-clay Coal.

Sandstone	5 Feet.
Shale	12 Feet.
Lime rock	6 to 8"
Black shale	2"
Coal and 5 partings	34"
Altitude, 1145.	

At 2 yards into the upper entry the coal and partings, of which there are but three, are reduced to 31 inches. Under this is 2 inches of bituminous shale and then fire-clay to sandstone beneath. Though apparently at about the right height for the Whitesburg bed, that bed having been found, as just mentioned, at a lower level, and these openings resembling in their bed-sections and coverings the Fire-clay coal opening on Martin creek, they are confidently referred to the latter bed.

SCHOOLHOUSE BRANCH.

On the right, $8\frac{3}{4}$ miles from Manchester. Altitude of mouth, 830.

On the left, $\frac{1}{2}$ mile up the branch, Joseph Keene has a long entry with section as given following, taken 3 yards in:

Howard Bed.

Sandstone	10 Feet.
Shale	1 Foot.
Coal	3"
Knife-edge parting.	
Coal	20"
Black shale	20"
Coal	9"
Altitude, 890.	

On the left, $9\frac{1}{4}$ miles up Goose creek, Elhannon Wilson had an entry which gave the following bed-section:

Howard Bed.

Shale	8 Feet.
Coal	2"
Shale	1"
Coal	2"
Shale	1"
Coal	16"
Shale	10"
Coal	15"
Altitude, 900.	

MARTIN CREEK.

On the left, $9\frac{1}{2}$ miles from Manchester: Altitude of mouth, 830.

Outcrops of the Howard bed, split into two seams, show in and by the road, on the left, $\frac{1}{8}$ to $\frac{1}{4}$ mile up this creek at altitudes 915 and 920; and again by the road, $1\frac{1}{4}$ miles up, where they are 15 feet apart, at altitudes 905 and 920.

In a pit, $\frac{1}{8}$ mile up a right branch and in it, $1\frac{1}{4}$ miles up Martin creek, the coal is reported 20 inches thick. At altitude 895, it is probably of the lower seam.

MOSES BRANCH.

On the right, $1\frac{3}{4}$ miles up Martin creek: Altitude of mouth, 905.

On the right, $\frac{1}{4}$ mile up this branch, Silas Wages has opened the Fire-clay coal with the following section:

Fire-clay Coal.

Sandstone	4 Feet.
Shale	6 Feet.
Coal	4"
Shale	1"
Coal	12"
Shale	1"
Coal	6"
Flint fire-clay	4"
Black jack	4"
Altitude, 1225.	

Next below the black jack is said to be 30 inches of shale and then a foot more of coal.

The upper split of the Howard coal is probably about at altitude 925, giving the interval between the Howard and Fire-clay beds as 300 feet. Adding to this the 250 feet interval from the Howard bed to the Manchester, as found on Goose creek just above Collins fork, gives 550 feet interval between the Fire-clay coal and the Manchester bed; a close agreement with the 535 feet found between them near the mouth of Goose creek.

On the left, $\frac{1}{2}$ mile up the branch, J. B. Walker has an entry with the following section, as measured at its mouth:

Haddix Bed.

Shale	5 Feet.
Shale with coal	10"
Coal	9"
Shale	2"
Coal	22"
Shale	20"
Coal	8"
Cannel coal	10"
Altitude, 1405.	

At the faces, 60 yards in, the bottom coals are reduced from 18 inches to 15 and 17 inches, the parting next above them is increased to 22 and 24 inches, and at one face the upper part is 37 inches thick, including a parting of 1 inch, 2 inches from the top.

Some 30 to 40 feet above the coal is a 15-foot cliff, a common attendant to the Haddix bed.

Assuming that strata lie level between this and the Fire-clay coal opening, as they probably nearly do, the interval between these two beds is 180 feet.

At Mr. Walker's house, on the left, 2 miles up Martin creek, the stain of the upper split of the Howard coal shows at altitude 940.

STEWART BRANCH.

On the left of Goose creek, $10\frac{1}{4}$ miles from Manchester.

On the left, $\frac{1}{4}$ mile up this branch, Laura R. White has a wet entry, under 5 feet of shale, into the upper

split of the Howard bed, giving 24 inches of coal at altitude 905.

The same coal has been partly opened by the road up Goose creek, $10\frac{3}{8}$ miles from Manchester, at altitude 892.

BROWN BRANCH (OR BLYTHE).

On the right, 11 miles from Manchester.

A prospect of Laura R. White's on the right, $\frac{1}{4}$ mile up this branch, gives 22 inches of coal, under 5 feet of shale and on a black slate and coal floor; again the upper split of the Howard bed with altitude of 885. The lower split is reported in the branch, 10 feet lower, with coal 24 inches thick.

OTTER CREEK.

On the right, $11\frac{1}{4}$ miles from Manchester: Altitude of mouth, 847.

On the right, $\frac{1}{8}$ mile up this creek, Robert Wood has a long entry into the Howard bed, with 23 inches of coal measured 4 yards in, at altitude 875. Sandstone from its floor to the creek, 25 feet below, prove it of the lower seam of the bed. Over the coal are $2\frac{1}{2}$ feet of shale and then 12 feet of sandstone and shale.

Of old entries on the right, $11\frac{1}{4}$ miles up the creek, in the lower split of the same bed, one gives 22 inches of coal under 7 inches of coal and shale, upon which is a laminated sandstone showing a tendency to honeycomb. The entry is at altitude 890.

At the forks, $1\frac{3}{4}$ miles up Otter creek, altitude 895, is a cliff on the left over the Howard bed, composed of shaly sandstone and shale, which can be recognized at frequent intervals farther up the creek until it goes below drainage, and also on Goose creek for two miles above Otter creek.

On the right, at the Otter forks, 18 inches of coal, the upper seam of the Howard bed, is exposed at altitude 900.

RIGHT FORK.

At Vogel Postoffice on the right, $11\frac{1}{2}$ miles up this fork, is 10 inches of coal, under 8 feet of dark shale, and then a thick massive sandstone. Its altitude is 1005, 20 feet above the creek.

On the right, $\frac{1}{8}$ mile up a right hollow at Vogel, is a long entry having 15 inches of coal at its mouth, 10 feet of hard sandstone under its $1\frac{1}{2}$ feet of fire-clay floor, and above it 5 feet of shale under sandstone. Its altitude, 1200, makes it 300 feet above the Howard coal at the forks of Otter creek, and therefore the Fire-clay coal, as the strata lie nearly level along the creek to this point.

At the mouth of Swafford branch, $2\frac{1}{2}$ miles up the fork, the lower coal at Vogel goes below drainage at altitude 995.

On the right, $3\frac{1}{4}$ miles up the fork, 20 feet above it, is 16 inches of coal under 3 feet of shale and 4 feet of sandstone, at altitude 1215. Probably again the Fire-clay coal.

On the right, $\frac{1}{4}$ mile up a right branch at this place, J. G. Matthews has a 10-yard closed entry at altitude 1515. Apparently the bed is about 3 feet thick, under 5 feet of shale and then sandstone. Black slate, bituminous and cannel coal were found in the dump, the latter in blocks 8 to 10 inches thick. Sandstone cliffs 15 feet high cap the hills 50 feet above the coal. The bed has the characteristics of the Flag bed, and, 300 feet above the supposed Fire-clay coal, is, with little doubt, so correlated.

LEFT FORK—KNOB LICK BRANCH.

On the left, $\frac{1}{4}$ mile up the left fork: Altitude of mouth, 910.

On the right, $\frac{1}{4}$ mile up the branch, John Duff has a long entry, measured 15 yards in, giving 42 inches of coal at altitude 1460. The bottom coal is an especially fine bright block without cleavage planes, and the whole looks good. Six inches of shale under 10 feet of sandstone overlie the coal, and a 15-foot sandstone caps the hill 50 feet higher, as on the head of the right fork. This, also, is about 600 feet above the Howard bed and is referred to the Flag bed.

On the left, $\frac{3}{4}$ mile up the branch, 10 feet above it, an entry 2 yards in gives 16 inches of coal, under 4 feet of shale, the upper 3 feet sandy, at altitude 1125. This is probably of the Fire-clay coal.

At a spring on the right, $\frac{1}{2}$ mile up the left fork, is 3 inches of coal, probably of the Fire-clay coal bed, at altitude 1120. An opening at the place would very likely uncover more coal below.

DRUM BRANCH.

On the left at Albert May's, $\frac{3}{4}$ mile up the left fork.

On the left, $\frac{1}{4}$ mile up the branch, is a stripping, 40 yards long, disclosing the following:

Fire-clay Coal (?)

Shaly sandstone	12 Feet.
Shale with calcareous concretions	3 Feet.
Coal	7"
Shale	3½ Feet.
Coal	16"
Fire-clay.	
Altitude, 1140.	

The left fork has forks $1\frac{3}{4}$ miles up it. Thence, on the left of the right fork, $\frac{1}{4}$ mile up it, John G. Matthews has a 5-yard entry, on shale and under sandstone, with 25 inches of coal at its mouth, and at altitude 1190. This is probably of the Haddix bed.

From the forks, $1\frac{3}{4}$ miles up, to a right branch $\frac{1}{2}$ mile up the left fork, the sandstone over the coal last mentioned is passed over and a change met from a narrow valley to a comparatively open country with lighter slope to its hills. This is ascribed to the resistance to disintegration of the hard sandstone over the Haddix coal.

The mouth of the branch just referred to is at altitude 1250. On the right $\frac{1}{4}$ mile up it is a covered opening into what is presumably the Hazard coal at altitude 1295, a rise of strata from the opening on the right fork of possibly 50 feet being assumed, though against the direction of the prevailing dip. The topography indicates a continued southwest rise to the Mill creek divide.

Both on the right and left of Goose creek, $11\frac{1}{2}$ miles from Manchester, $\frac{1}{4}$ mile above Otter creek, Robert Wood has openings into the Howard bed; at altitude 870. On the right into the lower split with 22 inches or more of coal; and on the left into the upper split with the following section:

Howard Bed. Upper Split.

Shale	15 Feet.
Coal	4"
Shale	3"
Coal	18" or more.
Altitude, 870.	

Both of these openings were in water and only the top of the coal seen.

The 50 feet of shale exposed at the mouth of Mud Lick shows that both parts of the Howard bed are at or below creek level there, which is at altitude 864.

TIMBERTREE BRANCH.

On the left, $12\frac{3}{4}$ miles above Manchester: Altitude of mouth, 865.

Following are the three coals found on this branch; none carried under roof: On left, $\frac{7}{8}$ miles up:

Fire-clay Coal Rider.

Rough sandstone	5 Feet.
Coal	7"
Clay	1"
Coal	5"
Altitude, 1245.	

On right, $\frac{5}{8}$ miles up:

Whitesburg Bed.

	Feet.
Laminated sandstone	5
Black shale with sandstone part- ing	1½
Shale and coal	5
Altitude, 1160.	

On right, $\frac{3}{4}$ mile up:

Fire-clay Coal.

Shaly sandstone	12	Feet.
Coal	6"	
Flint fire-clay	6"	
Coal	6"	
Altitude, 1215.		

All are on steep hillside within 30 feet of the branch. In the Whitesburg bed there are 3 seams of coal, the thickest not more than 12 inches.

The Howard bed being at altitude about 865 at the mouth of the branch, a rise of strata up the branch of some 50 feet is indicated, in order to bring that bed to 300 feet below the Fire-clay coal.

A bench on the right of the openings at altitude 1380 gives the approximate position of the Haddix bed, its attendant 20-foot cliff above it with top at altitude 1405. A bench at 1445 marks the place of the Hazard coal. With the hill rising 140 feet higher these coals have area for working here if found of sufficient thickness.

TOM'S BRANCH.

On the right, $1\frac{1}{2}$ miles from Manchester: Altitude of mouth, 870.

In a former search for coal on this branch there was found the following at J. T. Smith's, near the mouth of the branch:

Sandstone cliff	50	Feet.	Altitude, 1370.
Covered	15	Feet.	
Shale	1	Foot.	
Clay with lime concretions	1	Foot.	
Shale	2	Feet.	
Black slate	15"		
Shale	10"		
Coal	11"		Altitude, 1350.
Clay.			
Covered	20	Feet.	
Massive sandstone	10	Feet.	
Earth and thin iron ore	1½	Feet.	
Massive sandstone	1½	Feet.	
Coal	9"		Altitude, 1315.
Covered.			
Dark impure limestone	2	Feet.	Altitude, 1275.

Covered.		
Shaly sandstone	10	Feet.
Coal	12"	Altitude, 1240.
Clay.		
Covered.		
Shale	5	Feet.
Iron ore	3"	
Shale	2	Feet.
Thin coal		Altitude, 1200.
Covered.		
Sandstone	20	Feet.
Coal	18"	Altitude, 1145.
Covered.		
Shaly sandstone	10	Feet.
Clay	6"	
Coal	21"	
Shale	1"	
Coal	1"	Altitude, 1075.
Clay	5"	
Shale and sandstone	20	Feet.
Covered.		
Shale	5	Feet.
Shaly sandstone	4	Feet.
Coal	30"	
Cannel coal	5"	Altitude, 915.

My sample of the 30 inches bituminous coal and a specimen of the cannel from a now abandoned entry into the lowest bed just noted, taken from 5 yards underground, yielded, on analysis by Dr. Peter:

J. T. Smith Entry.	No. 2653.	No. 2655.
	Bituminous.	Cannel.
Moisture	2.80	0.30
Volatile combustible matter	29.40	44.16
Fixed carbon	57.00	43.74
Ash	10.80	11.80
	100.00	100.00
Sulphur	1.178	1.244
Coke	dense friable.	dense.
Color of ash	light brown.	dark gray.
Specific gravity		1.60

This bed is probably the same as that at Vogel, on Otter creek, altitude 1005, about 100 feet above the Howard bed. The Fire-clay coal may be there, between those

of the preceding section at altitudes 1075 and 1145, the Haddix at 1240 and the two higher coals of the Hazard and Flag beds. The absence of any thick coal in this vicinity is almost conclusively proved by these seven coal beds found.

MILL BRANCH.

On the left, $13\frac{3}{4}$ miles from Manchester: Altitude of mouth, 875.

On the left, $\frac{3}{4}$ mile up this branch, and 15 feet above it, Anderson Smallwood has an entry in which the following bed-section was taken, necessarily at several points underground:

Rough cliff sandstone	20	Feet.
Covered	20	Feet.
Sandstone	10	Feet.
Shale	1	Foot.
Shale and coal	3"	
Coal	4"	
Shale	1"	
Coal	20"	
Sandstone	11"	
Shale	6"	
Coal	4"	
Jack-rock	7"	
Coal	23"	

Altitude, 1060.

This brown jack-rock near the bottom of this bed, similar to that found on Timbertree branch beneath the flint fire-clay of the Fire-clay coal bed serves to correlate this as of the Fire-clay coal bed, the next parting above, of uniform thickness in the entry, but variable proportion of sandstone to shale, possibly being the only separation of the bed from its rider.

The Haddix bed is exposed in a rock house on the left, one mile up the branch, with the following section:

Sandstone	4	Feet.
Coal	9"	
Shale	4"	
Coal	12"	
Covered	5	Feet.
Shale	10	Feet.

Altitude, 1230.

A quarter-mile farther up the branch the flatter topography, due to the hard sandstone under the Hazard bed and soft shales above it, as on the left fork of Otter creek, is plainly evident.

In the left bank of Goose creek, $14\frac{1}{2}$ miles from Manchester, a stripping has been made with 16 inches of coal under 3 feet of shale and 50 to 60 feet of sandstone. This, at altitude 886, is probably of the Whitesburg bed, involving a dip from Tom's creek of nearly 200 feet in about a mile, the maximum along the stream from Manchester where the southeasterly dip begins, and to Mill creek, near which it ends.

On the right branch, $14\frac{3}{4}$ miles from Manchester, on the right, $\frac{3}{4}$ mile up the branch, and 25 feet above it, Frank Wages has an opening into the Haddix bed with 19 inches of coal, at altitude 1110. The coal is in part "bird-eye" (showing smooth shiny black spots up to $\frac{1}{2}$ inch diameter however any lump may be broken) with fine apparent granulation, like the Jellico coal, but impossible to be of that bed. Above and below the coal is an inch or two of black slate, and on the slate 10 feet of shale.

MILL CREEK.

On the right, 15 miles from Manchester: Altitude of mouth, 892.

With the Whitesburg bed supposedly 10 to 20 feet under the mouth of Mill creek, the Fire clay coal should be found on one of the low cliffs opposite and not over 50 feet above it.

On the left, $\frac{1}{2}$ mile up the creek, Thomas Smith has a 3-yard entry, under 10 feet of sandstone, with 18 inches of coal at altitude 1005; probably the Fire-clay coal rider.

A mile up Mill creek, on the right, $\frac{1}{2}$ mile up a right branch there, the Bowen heirs have an opening, not driven to roof, in which the following appears:

Earth	18"	
Coal	3"	
Knife-edge parting	1"	
Coal	9"	
Shale	1"	
Splint coal	9"	

Altitude, 1400.

If, as appears to be the case, the Haddix bed is here at about altitude 1140, this must be of the Hindman or a still higher bed. It does not appear to have the soft shale covering which is almost, if not quite invariably, a marked feature of the Hindman bed.

Mill creek has forks $1\frac{3}{4}$ miles from its mouth.

RIGHT FORK.

On the right, $\frac{1}{4}$ mile up the fork, 10 feet above it, an entry shows about 2 feet of coal with 2 feet of shale and then 5 feet of laminated sandstone above it, of the Haddix bed, at altitude 1150.

A rapid rise of strata up the right fork is evident, and at 1 mile up the fork in the road on the right, the stain of the Hazard coal is exposed, at the base of yellow shales, at altitude 1300. The cliff-rock under the coal is conspicuous in the road a half-mile below and the country is more open after ascending it, as noted across the divide to Otter creek.

LEFT FORK.

On the right, $\frac{1}{8}$ mile up this fork, the Bowen heirs have an entry into the Haddix bed with 22 inches of coal at the face, 10 yards in, under 15 feet of sandstone, the lower two feet of which is shaly. Its altitude is 1130.

On the right, $\frac{1}{4}$ mile up and at stream level, the same bed is opened with 24 inches of coal, under 2 feet of shale and then 10 feet of shaly sandstone, at altitude 1140.

From this opening the valley rises quickly over the sandstone to the Hazard bed level, where it is comparatively flat again.

ASHER FORK.

On the left, $16\frac{1}{2}$ miles above Manchester: Altitude of mouth, 941.

On the left, $\frac{1}{2}$ mile up the fork, at John Roark's, is 6 inches of coal (the Whitesburg bed?) at altitude 995, and an opening into about 3 feet of coal, with one inch shale parting in the middle and 3 feet of shale upon it, at altitude 1240. The same bed, probably the Haddix, shows on the right of the fork at the same height.

Coal has been taken from the fork, $11\frac{1}{2}$ miles up it, at altitude 1295, probably from the Fire-clay coal rider as the strata rise rather rapidly after the first mile up the fork to this point.

At Charles Roark's, 2 miles up, 100 yards north of the road where it crosses the Red Bird divide, is a 10-yard entry with 25 inches of coal, under 5 feet of shale, possibly of the Hazard bed, at altitude 1485. Though level with the gap, a large area of this bed is present here, the hills rising 300 to 400 feet above it.

Opposite the mouth of Asher fork, on the right of Goose creek, an old opening of the late Woodson Mills gave the following section:

Fire-clay Coal (?).	
Shale	5 Feet
Coal	1"
Shale	5"
Coal	1"
Coal	4"
Shale	2"
Coal	18"
Black slate	3"
Coal	4"
Altitude, 1060.	

The bottom coal, in water, was not fully seen.

This appears likely to be of the Fire-clay coal bed, but, as with other openings above Mill creek, there was found little more definite guide to correlation than their altitudes combined with the apparent rise or fall of strata.

STEWART BRANCH.

On the left, $17\frac{1}{2}$ miles from Manchester: Altitude of mouth, 983.

On the right, $\frac{1}{4}$ mile up the branch, 10 feet above it, is 7 inches of coal, with a foot of shale and coal under it, and 10 feet of laminated sandstone upon it, which, at altitude 1025, may represent the Whitesburg bed.

On the left, $\frac{3}{4}$ mile up the branch, Bailey Stewart has an opening into the same bed as that of the Mills opening opposite the mouth of Asher fork, from which the following was obtained:

Fire-clay Coal (?).

Laminated sandstone	10	Feet.
Clay sandstone	20	Feet.
Shale	1	Foot.
Coal	21 to 24"	
Shale	2"	
Coal	4"	
Altitude, 1125.		

Rise of strata up the branch is probably rapid. The shale roof has abundant fine bark impressions, said also to be frequent in the roof of the Mills opening.

Cliffs on the right of Goose creek, $17\frac{3}{4}$ miles from Manchester, seemed to offer a help to correlation and their altitudes were obtained. With the creek at this point at altitude 1000 slight benches were found at approximate altitudes of 1060, 1140 and 1165, indicating the locations of the Whitesburg and Fire-clay coals and the rider; a 10-foot cliff at 1455 near the top of the hill. Under these cliffs are probably the Haddix and Flag coals.

On the left of Goose creek at the Jackson mill site, $18\frac{1}{2}$ miles from Manchester, the following section was formerly obtained from a now abandoned opening of the Smith heirs:

Fire-clay Coal (?).

Shale and shaly sandstone	5	Feet.
Coal	4"	
Shale	3"	
Coal	27"	
Shale	2"	
Coal	15"	
Altitude, 1120.		

HUN JACKSON BRANCH.

On the right, $18\frac{3}{4}$ miles from Manchester: Altitude of mouth, 1050.

On the right, $\frac{1}{4}$ mile up the branch, Isaac Jackson has a long entry into the Fire-clay coal with a rider six feet above it as in the following section:

Fire-clay Coal (?).

Black slate	3	Feet.
Cannel coal	10"	
Shaly sandstone	6	Feet.
Coal	51"	
Black slate.		
Altitude, 1145.		

Analysis of my sample of the 51 inches of bituminous coal by Dr. Peter yielded:

Fire-clay Coal.

	No. 2647.
Moisture	1.10
Volatile combustible matter	35.60
Fixed carbon	56.90
Ash	6.40
	100.00
Sulphur	0.885
Coke (light spongy)	63.30
Specific gravity	1.288

"A pure-looking coal. No apparent pyrites and but little fibrous coal. Ferruginous stains on some of the pieces."

INDIAN GRAVE BRANCH.

On the left, $19\frac{1}{4}$ miles from Manchester: Altitude of mouth, 1073.

On the right, $\frac{1}{8}$ mile up the branch, a 3-yard entry into what appears to be the Fire-clay coal gives 34 inches of coal, under sandstone, at altitude 1120. This bed goes below drainage $\frac{1}{2}$ mile up the branch with 19 inches of coal, under 25 feet of sandstone, at altitude 1120.

Thirty feet above this last coal is 13 inches more coal under 7 feet of shale in which is about 6 inches of black slate. The coal is probably the rider showing as cannel coal on Hun Jackson branch.

On the left at the branch, $1\frac{1}{4}$ miles up, opposite Isaac Jackson's house, is an 8-yard entry into the Haddix(?) bed, which gave great improvement as it was advanced underground, as shown by early and recent measurements:

At Mouth.		At Face.	
Sandstone.		Sandstone.	
Coal	3"	Coal	8"
Shale	3"	Parting	1"
Coal	7"	Coal	7"
Clay	5"	Bone coal	1"
Coal	14"	Coal	20"

Altitude, 1370.

The coal is bituminous with a little splint, all apparently good, the former bright and rich-looking, with some in which the lamination is hardly perceptible. The upper parting at the face is a mixture of shale or clay pyrites, which may be expected to disappear on farther entrance into the hill.

A half-mile up the right fork from Jackson's house the following was obtained which, in its abundance of shale and clay and height relative to the preceding coal, seems to identify the coal as of the Hazard bed:

Hazard Bed.

Shale	5 Feet.
Coal	11"
Clay	1 Foot.
Sandstone	5 Feet
Coal and shale	17"
Shale	5 Feet.

Altitude, 1410.

On the right, $19\frac{3}{4}$ miles above Manchester, 100 yards below a schoolhouse, is 16 inches of coal in sandstone, at altitude 1150. This bed shows again, on the left, 20 miles above Manchester, 18 inches of coal, on 4 inches of black slate and under 15 feet of sandstone, at altitude 1185, and 35 feet above the creek. These two are probably of the Fire-clay coal bed.

BUCK SMITH BRANCH.

On the left, $20\frac{3}{4}$ miles from Manchester: Altitude of mouth, 1201.

On the right, $\frac{1}{8}$ mile up the branch, is 11 inches of coal, under 5 feet of shaly sandstone, at altitude 1235.

Strata appear to rise up the creek here faster than its bed, and this, therefore, is probably of the Whitesburg bed.

A mile up the branch to its forks at altitude 1360, on the right, $\frac{1}{4}$ mile up the right fork, is Darby Smith's entry with the following section:

Shale	2 Feet.
Black slate with coal	2 Feet.
Shale	1 Foot.
Coal	16"
Shale	14"
Coal	29"

Altitude, 1715.

Strata doubtless rise rapidly from the mouth of the branch to this coal, which must be of the Flag or a higher bed, but no evidence was discovered as to which one of them. A large area of these coals is available here, as the hills rise to a height of over 2000 feet.

On the left, just above the mouth of Buck Smith branch, is 6 inches of coal under 6 feet of shale, the bottom half of which is black, at altitude 1215. This seems to be the same as the 11 inches coal $\frac{1}{8}$ mile up the branch, and illustrates the variability of roof and weathering of sandstone into shale.

At Paint gap to Stinking creek, $21\frac{1}{2}$ miles from Manchester, the altitude is (exactly) 1645.

The foregoing cover practically all coal openings on Goose creek waters open to inspection, but on the head of the Right fork of Stinking creek some 2 or 3 miles southeastward from Paint Gap, is a 15-yard entry into what is probably the Fire-clay coal, which gives promise of that bed being workable in Kentucky ridge, possibly on the Goose creek side, and casts some doubt upon the correlation of the Fire-clay coal, as given, where thin above Hun Jackson branch.

This (Stinking creek) entry 25 feet above the creek, belonging to Mrs. Taylor, has the following section as measured, the top at the face and the bottom at the mouth of the entry:

Fire-clay Coal (?)

Massive sandstone	15 Feet.
Coal .....	.31"
Shale	4"
Coal .....	.10"
Knife-edge parting.	
Coal .....	.13"

Altitude, 1430.

In a second entry, 100 yards farther up the creek, the upper parting is reduced to 3 inches and the lower is wholly absent. Twelve feet below is 16 inches more coal.

So far as learned there is no other opening of the bed on the headwaters of the right fork of the creek.

There is, however, good reason for belief in continued thickness of the bed southward to the Left fork of Straight creek.

On that fork, some 2 miles southward from the entry last given, C. C. (or J. B.) Knuckles has entries into the Fire-clay coal giving the following sections:

On Left.		On Right.	
Sandstone	20 Feet.	Sandstone	15 Feet.
Coal	42"	Shale with coal	4 Feet.
Shale	2"	Coal	33"
Coal	10"	Shale	1"
Shale	1"	Coal	5"
Coal	4"	Knife-edge parting.	
		Coal	3"
		Knife-edge parting.	
		Coal	3"
		Shale	6"
		Coal	10"

Altitude, 1435.

The flint fire-clay was found here 3 to 6 inches below the bottom coal instead of in its usual place as a parting.

A mile westward from these entries, on the left of the branch giving the road from Straight to Stinking creek, Brit Slusher has a long entry into the same bed with the following section at its mouth:

Fire-clay Coal.

Shale	1 Foot.
Coal	32"
Shale	8"
Coal	8"

Altitude, 1485.

REPORT ON THE COALS OF THE NORTH FORK OF KENTUCKY RIVER FROM HAZARD DOWN TO KRYPTON.

BY

J. M. HODGE

1914.

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COALS OF THE NORTH FORK OF KENTUCKY RIVER.

This report treats of the coals in Perry County on the south side of the North Fork of Kentucky River, and its tributaries from Campbell Creek to Big Creek inclusive. Since earlier reports were made for the Kentucky Geological Survey covering this region many new openings into the coal beds have been made, and after having visited nearly all of them in condition for inspection a nearly accurate estimation of the field is believed obtainable from the data acquired and here presented.

During the investigation a survey was made of the creeks by the Kentucky Geological Survey, the results of which are embodied in the accompanying map, on which also are located the openings visited.

The topography of the region is like that generally of Eastern Kentucky, a succession of narrow valleys with steep sides to the tops of sharp serrated ridges, though at the main head of Campbell Creek the country is somewhat more open. Campbell and Forked-mouth creeks have especially narrow valleys with practically no bottom land, and the North Fork in this region has also comparatively little for so large a stream.

Altitudes range from 795, that of the North Fork at the mouth of Campbell Creek, where the hills are some 500 feet high, to about 2,000 feet at the head of Big Creek, where they rise to a height of some 700 feet above that stream.

Strata lie nearly level but with a general north-westerly dip from the head of Big Creek to Forked-mouth Creek, which, approximately, lies in a syncline, the measures thence rising slightly to Campbell Creek and beyond.

From the head of Big Creek to the mouth of Forked-mouth Creek, a total airline distance of ten miles, the fall of strata amounts to about 130 feet, but this dip is not uniform. Along the middle half of Big Creek strata lie

nearly level and even a reverse dip is noted, but so slight that it may be only a result of barometric inaccuracy.

The effect of irregularity in the dip is to increase the maximum, but neither in this northwesterly direction nor on the sides, where strata usually dip in the direction the streams run, is there believed to be a dip of more than one per cent. except in a few unimportant local rolls.

A general section for the region follows. This section will vary in detail at different places as noted hereafter.

General Section.

Mainly sandstones.
Hindman coal bed, shale roof.
Interval 150 feet, mainly sandstones.
Flag coal bed, sandstone roof.
Interval 60 feet, sandstone at top.
Hazard coal bed, heavy shale roof.
Interval 60 feet, sandstone.
Haddix coal bed, sandstone roof.
Interval 150 feet, sandstone at top.
Thin coal bed in shale.
Interval 100 feet, sandstone at bottom.
Fire-clay coal bed, sandstone roof.
Interval 50 feet.
Whitesburg coal bed, sandstone roof.

THE WHITESBURG BED is so split up into thin seams with thick partings as to include, in its few exposures near the river, a thickness of strata of 20 to 30 feet. No attempt was made to measure them all and their intervals, though they are well exposed on Big Creek near its mouth. Part or all of them are also well exposed at Hazard on Messer Branch.

The interval given of 50 feet up to the Fire-clay coal is regarded as normal and is about the distance from the upper seam of the Whitesburg coal up to the Fire-clay coal. As seen on Brown Fork of Big Creek the lower 20 feet of this interval is sandstone and the remainder shales and shaly sandstones; elsewhere in this region the upper half is usually of soft material while in other fields it has been found as a particularly hard sandstone. A seam of coal, apparently an off-shoot from the Fire-clay coal, was found along the river 5 to 10 feet

below that bed. On Big Creek a layer of limestone is found at about this horizon.

THE FIRE-CLAY COAL, mined at Hazard and at Lennut, below Hazard, is exposed at numerous places scattered over the region. It is of extremely variable section but always with only a very few inches of coal, excepting along the river and possibly where it goes below drainage, 6 miles up Big Creek.

Along the river front are some available working areas, especially favorable in their locations, but the coal is barely thick enough for present mining, and it is altogether probable that that thickness does not hold good far into the hill.

A piece of the flint fire-clay parting from this bed laid on a hard surface and struck sharply with a hammer breaks into many somewhat cuboidal fragments showing no evidence whatever of lamination. So far as known no other coal bed has such material in its partings, nor has it been found in any of the measures near the horizon of this bed, except in connection with it.

Generally a thick, hard sandstone lies immediately over the Fire-clay coal, and this is especially noted on Willard Creek, but on Big Creek it is inconspicuous and is largely replaced by shales and shaly sandstones, in which are thin seams of coal and black slate.

Possibly these coals and others on Big Creek found there to a height of 60 feet above the Fire-clay coal combine to form the rider to that bed, occasionally workable in other regions, but giving only one sign of its presence in this region other than on Big Creek. Where not wholly absent it is certainly valueless.

In two widely separated places fossil limestone was found, probably 50 feet above the Fire-clay coal. From the rider to within 20 to 40 feet of the Haddix coal is here, as usual, a succession of shales and shaly sandstone.

About 100 feet up from the Fire-clay coal is another seam of coal, apparently constant in this as in adjoining regions, always presumably thin, though found at one place on Campbell Creek reaching a thickness of 3 feet. Though mined for local use there the coal is of poor quality.

On Willard Creek it was found as a slaty cannel coal 32 inches thick.

Thin ledges of limestone were noted in this series of thin laminated measures at distances of about 180, 160 and 115 feet below the Hazard coal, the first two probably of the same horizon. Occasionally a massive sandstone appears in the top of the series, but not often unless it combines with cliff-making sandstones on the top and directly under the Haddix coal.

This latter rock (under the Haddix coal) is a conspicuous feature of the topography, presenting often cliffs on the hillsides 10 to 30 feet or more in height and with none others near below.

THE HADDIX COAL BED has now but few openings in this region showing thickness, from which it may be inferred that it is generally too thin to work. None whatever were found on Campbell Creek and those on Forked-mouth Creek have less than $2\frac{1}{2}$ feet of coal. Openings on Willard Creek give 3 feet of coal. On Big Creek none were found elsewhere than on Curley Fork, where the coal runs from 3 to 4 feet thick. The usual excellence of this coal makes it available where coal of poorer quality could not be mined profitably.

Above the Haddix bed, sometimes with a little shale between, is a hard, usually very smooth-faced sandstone 20 feet, more or less, thick.

THE YOUNG COAL BED elsewhere, lies about midway between the Haddix and Hazard beds. At Domino, 3 miles by rail below Hazard, about $3\frac{1}{2}$ feet of coal is opened beside the incline and 55 feet below the mine there opened into the Hazard coal bed, which may belong to this bed but may possibly be the Haddix coal, but in the region under present discussion no sign of this bed was found excepting in one uncertain instance.

The interval between the Hazard and Haddix coal beds is almost wholly of sandstone, appearing frequently in cliffs, the upper half particularly hard, so that in conjunction with the very soft strata above it, it has led to the formation of the principal bench of the hillsides throughout the region.

THE HAZARD COAL, by far the most valuable here, lies on this bench, or, not infrequently, where the rock below happened to be less resistant to disintegration, 10 to 15 feet above a subsidiary bench. Towards the head of Willard Creek it lies 250 feet above the Fire-clay coal,

but this interval increases to 310 feet at points along the river and up Big Creek.

No opening into the coal was found on Campbell Creek. On Forked-mouth it runs from $2\frac{1}{2}$ to $3\frac{1}{2}$ feet thick, but in quality the coal is deficient.

On Willard Creek above Little Willard it is generally 3 to 4 feet thick, tributaries on the west providing the thicker coal and probably of better quality towards the south. On the lower half of Little Willard the coal is 5 feet thick, but it runs down to less than $3\frac{1}{2}$ feet farther up stream and becomes poor in quality.

Along the river above Willard Creek the coal continues about 5 feet thick and in quality appears good. Though near the tops of the hills fronting the river, some good areas are available running up toward the Little Willard-Big Creek divide.

On Big Creek waters the coal is of workable thickness throughout excepting at the extreme head, ranging generally from 3 to 5 feet of coal, the latter thickness in extensive areas along the central part of the main creek. The quality here appears equal to that of the coal mined at Domino, which latter is said to find especial favor in the market. A thin seam of bone coal is found here near the bottom of the bed, as is the case at Domino. Some of this coal will be reached through mines already started on Buffalo Creek, above Hazard, but for most of it a railroad up Big Creek is needed.

In addition to the broad bench as a means for correlating this bed, it has usually 10 to 12 feet of clay shale covering, not always visible, almost or wholly devoid of fossils, but containing one or two thin seams of coal, apt to be found near the main bed. Above the shale is another cliff-making sandstone directly upon which is the Flag coal.

THE FLAG COAL shows a gradual increase in thickness from about 2 feet on Campbell Creek to 3 to 4 feet on Big Creek. While the coal is generally good its height in the hills militates seriously against it. Where the Hazard bed is first mined beneath it, as promises to be the case in its best areas, the bed is likely to be largely ruined.

Close above the Flag bed is another hard sandstone and beyond that others continue, occupying most of the interval to the summits of the highest hills.

THE HINDMAN COAL BED can be found only in the high hills about the heads of Amy Fork of Big Creek and thence (if the hills are high enough) to the heads of the main stream. Though difficult of access and with small areas it is not unlikely that some of its thick, probably coking, coal may be utilized.

In giving the detailed description which follows of all the openings visited and other related matter the correlations are in some instances assumed with insufficient data for their determination. The three beds, the Had-dix, Hazard and Flag, are variable in all their features and resemble one another very closely in certain places and their proximity combined with their irregular dip and the errors of barometric observation require for certainty of correlation more development of the beds than now obtains. In all cases of importance, however, the correlations now given are believed to be true.

Altitudes of openings were obtained by aneroid from base levels by the U. S. Geological Survey, heights above tide having been determined at intervals along the streams. Distances given in miles or fractions thereof are approximate, intended only for guidance to openings: Given in yards underground they were estimated only approximately. Thickness of strata given in feet are approximate, but those in inches may be relied upon as correct. Entries having water in them sufficient to prevent going into them are designated as wet entries.

The terms right and left are used in describing locations always with the observer supposed to be looking up stream.

CAMPBELL CREEK.

The railroad station Krypton (Post Office, Glenn) is at the mouth of this creek, and at altitude 805. The mouth of the creek is about 790.

On the left, $\frac{1}{4}$ mile up the creek, Clark Campbell has an entry into the Fire-clay coal bed, not visited, said to have about the same section as in the entries on the river just above Krypton. This entry is now in operation while the latter are not. Exposures of the bed farther up the creek show it worthless there.

LEFT FORK.

On the left, $\frac{3}{4}$ mile up: Altitude of mouth, 850.

In a rockhouse on the right, $\frac{3}{8}$ mile up this fork, the Fire-clay coal, 5 feet above drainage has the following section:

Fire-clay Coal Bed.

Sandstone	20 Feet.
Coal	6"
Flint fire-clay	3"
Coal	10"
Altitude, 920.	

In the road above the rockhouse a coal stain shows at altitude 1010, too high for the Fire-clay coal rider and not recognized as an important bed.

On the right, $\frac{1}{2}$ mile up, Joseph Hamlin has a 10-yard entry into this bed, 10 feet above the fork, giving at its face the following:

Massive sandstone	5 Feet.
Coal	12"
Slaty coal	18"
Black slate and coal	3"
Coal	4"
Altitude, 995.	

While the whole bed section is mined and burned locally, its quality is not such as would find favor in open market.

Two entries on the left, $\frac{5}{8}$ mile up, show a foot of the same good coal at the top and 21 inches of slaty coal next below, with the remainder of the section covered.

A mile up the fork a prominent cliff has its top at altitude 1165. Allowing for dip up stream, this is nearly 300 feet above the Fire-clay coal and consequently the place for the Hazard coal bed. A bench, probably of the Flag coal, is 80 feet higher.

On the left, $1\frac{1}{2}$ miles up, directly on the sandstone of the cliff just noted, a 5-yard wet entry, 30 feet above the fork gives, at its mouth, some $3\frac{1}{2}$ feet of coal of the Hazard bed, under 10 feet of shale. In the shale is 2

inches of coal 3 feet above the main bed: Its altitude is 1155.

On a right branch, 1 mile up Campbell Creek, on the left, $\frac{3}{8}$ mile up the branch and 275 feet above its mouth, James Hamlin has a 12-yard entry into the Haddix bed, under 3 feet of shale, giving 26 inches of clean coal at the face and having 2 inches or more of black-jack floor. It lies directly on a prominent cliff (as seen across the branch), and at altitude 1160, is about 235 feet above the Fire-clay coal.

On a left branch, $1\frac{1}{4}$ miles up the creek, on the right, $\frac{1}{4}$ mile up the branch and 230 feet above its mouth, Nancy Eversole has an 8-yard entry into the Haddix bed, under 3 feet of shale, giving 32 inches of coal at the face. It is 5 feet above the top of a cliff and altitude 1140.

On the right of the main creek, $1\frac{1}{4}$ miles up it, just above the last mentioned branch, the following section is exposed at creek level:

Fire-clay Coal Bed.

Sandstone	20	Feet.
Coal	12"	
Shale	5 to 10	Feet
Red flint fire-clay	3"	
Shale	8"	
Coal	0 to 3"	
Fire-clay	0 to 1	Foot.
Laminated sandstone.		
Altitude, 915.		

While this variable section is in marked contrast to that on the left fork and along the river above Campbell Creek, and the red color of the fire-clay parting is most unusual there can be no doubt of the identity of the bed.

Right branch, $1\frac{3}{4}$ miles up Campbell Creek: Altitude of mouth, 955.

On the right of the branch, $\frac{1}{4}$ and $\frac{3}{8}$ miles up it are an abandoned entry and prospect on top of a cliff rock into what appears to be the Hazard bed at altitudes 1175 and 1155 respectively.

The branch forks $\frac{1}{2}$ mile up it and on the right of the left fork near its mouth Henry Campbell has an opening with the following section:

Flag Coal.

Shale	2	Feet.
Coal	7"	
Shale	7"	
Coal	5"	
Shale	6"	
Coal	14"	
Altitude, 1,290.		

The correspondence of this with the next opening following enables correlation. The altitudes given for openings on this branch are not altogether reliable.

A thin coal showing in the road on the left 2 miles up the creek is of the same bed found on the left fork 90 feet above the Fire-clay coal. It is about at creek level, at the forks, $2\frac{1}{4}$ miles up the creek.

RIGHT FORK.

On the right, $2\frac{1}{4}$ miles up: Altitude of mouth, 1005.

In a left hollow at the mouth of this fork, on the right at its head, $\frac{1}{8}$ mile up, William Huff has a 10-yard entry with the following section, at its face:

Flag Coal.

Shale	3	Feet.
Coal	11"	
Shale	1"	
Coal	4"	
Shale	3"	
Coal	15"	
Altitude, 1,260.		

The top of the cliff over the Haddix coal shows at altitude about 1180.

LEFT FORK: On the left, $2\frac{1}{4}$ miles up: Altitude of mouth, 1005.

On the right of this fork, at its head a half-mile up, about level with the gap through which the road to Hyden passes, William Huff has a long entry with the following section, 6 yards in:

Flag Coal.

Shale	3 Feet.
Coal	12"
Shale	4"
Coal	16"
Altitude, 1,280.	

The cliff under the Haddix coal appears here to be most prominent with its top at altitude above 1160.

The area of the Flag coal about the heads of the creek is small, but, if good thickness of the beds below it can be found, sufficient area for working this one is available. So far as development of these beds has gone the prospect is not encouraging.

On the right of the river, $\frac{1}{2}$ to $\frac{3}{4}$ mile above Campbell Creek, Clark Eversole has three entries into the Fire-clay coal from which some coal has been shipped by rail, but they are all abandoned now. They give the following sections:

Fire-clay Coal.

Measured.	At mouth.	10 yards in.	20 yards in.
Coal	28	27	28
Parting	6	6	6
Coal	11	8	4
Altitude, 890.			

The parting in the first two entries is wholly flint fire-clay, but in the third the upper half is more like a bone coal.

On the left of a right hollow, $\frac{3}{4}$ mile above Krypton, $\frac{1}{8}$ mile up the hollow, Lizzie Napier has a 10-yard entry into the same bed with the following section:

Fire-clay Coal.

Sandstone.	
Coal	28"
Flint fire-clay	5"
Coal	11"
Altitude, 890.	

BIG MEADOW (OLIVER) BRANCH.

On the right of the river, $1\frac{1}{4}$ miles above Krypton: Altitude of mouth, 795.

On the right of the branch, $\frac{1}{4}$ mile up, Jarrett Feltner has a 10-yard entry with the following section 2 yards in:

Fire-clay Coal.

Sandstone.	
Coal	26"
Flint fire-clay	5"
Coal	9"
Altitude, 885.	

A half-mile up the branch, 5 feet above it, John Jackson has two long entries with the following section at their mouths:

Fire-clay Coal.

	On Left.	On Right.
Sandstone	25 Feet.	
Coal	19"	24"
Parting	6"	7"
Coal	12"	12"
Altitude, 875.		

The upper half of the parting is here black-jack, the lower half flint fire-clay.

On the right, $1\frac{1}{2}$ miles above Krypton, William G. Napier has a 6-yard entry with the following section 1 yard in:

Fire-clay Coal.

Sandstone.	
Coal	23"
Black slate	3"
Flint fire-clay	3"
Coal—not measured.	
Altitude, 885.	

LITTLE MEADOW BRANCH.

On the right, 2 miles above Krypton: Altitude of mouth, 795.

On the right of the branch, $\frac{1}{8}$ mile up it, John Duff has a 12-yard entry with section as follows, taken at its mouth:

Fire-clay Coal.

Sandstone.	
Coal	22"
Bone coal	2"
Flint fire-clay	3"
Coal	7"
Altitude, 880.	

The bed goes below drainage, $\frac{1}{4}$ mile up, with 24 inches of top coal.

A mile up the branch to a right branch, and on the left $\frac{1}{4}$ mile up the latter, Garrard Campbell has a 6-yard wet entry into the Flag bed, under 10 feet of sandy shale. It has probably about 3 feet of coal and is at altitude 1270. The bed has in this river hill but 50 to 75 feet of covering and nowhere else in the vicinity appears a workable area. The gap between the two Meadow branches is at altitude 1035, level with the top of the cliff below the Haddix bed, apparently, though some 50 feet lower than was to be expected.

The following sections were taken along the railroad track between the mouth of Little Meadow Branch and the Campbell river-bend.

Fire-clay Coal.

Miles from Krypton	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{7}{8}$
Coal	32"	26"	24"
Flint fire-clay	6"	5"	4"
Coal	11"	7"	8"
Altitude	865	855	870

All have sandstone roof. The first was measured at the face of a 10-yard entry, the others, 100 yards respectively, below and above the Campbell bend tunnel, at the mouths of long entries made during railroad construction apparently.

In the road on the left of the river, opposite the upper end of the Campbell Bend tunnel, $2\frac{3}{4}$ miles below Yerkes, floating fossiliferous limestone was found which must have come from 40 to 80 feet above the Fire-clay coal. The fossils were not abundant and were generally much broken, but if they prove to be like those found in the limestone of the Black mountains 500 feet, more or less, above the Fire-clay coal an important clue to the correlation of the higher coals of that region and this may result. A reduction in thickness of measures, northward from Black Mountain is known and the elimination of 400 or 500 feet of the interval between the Fire-clay coal and limestone may reasonably be looked for in this locality.

On the right of the river (facing up stream) Joseph Campbell, John Colwell and Green B. Campbell have 5 to 10-yard entries at $2\frac{1}{2}$, $2\frac{1}{4}$, and $1\frac{3}{4}$ miles below Yerkes, respectively, the latter 30 feet above the railroad at mile-post "L 126." The first one shows 15 feet of shaly sandstone under it and all are covered by 20 feet of massive sandstone. Their bed sections follow:

Fire-clay Coal.

	(1)	(2)	(3)
Coal	12"		
Shale	1"		
Coal	14"	27"	26 to 28"
Flint fire-clay	5"	4"	5"
Coal	9"	12"	10"
Altitude	865	855	855

In the second section 3 inches of the coal, 6 inches from the bottom, is bony.

CARY BRANCH.

On the right of the river, $1\frac{1}{4}$ miles below Yerkes: Altitude of mouth, 800.

The uniformity of the Fire-clay coal shown above is not continued to this branch.

On the right near its mouth a foot of coal shows in the road at altitude 865, with 15 feet of shale over it to the Fire-clay coal at altitude 880. The bed here, as ex-

posed in the road, has, under sandstone, only 12 inches of coal, with 3 inches of flint fire-clay parting in the middle.

On the right of the branch, at its head, $\frac{5}{8}$ mile up, Cary Couch has a short entry into the Flag bed, at altitude 1265, having 26 inches of fine-looking coal under shaly sandstone, and with 6 inches of black slate floor. Prospecting for lower beds is said to have resulted in finding no coal thicker than 18 inches (of the Hazard or Haddix bed).

FORKED-MOUTH CREEK.

The railroad station Yerkes is at the mouth of this creek, which is at altitude 795.

On the left, $\frac{3}{8}$ mile up (below Laurel fork), the following section is exposed from the creek level up:

Fire-clay Coal.

Shaly sandstone	10	Feet.	
Black slate	2"		
Flint fire-clay	4"		
Coal	10"		Altitude, 855
Fire-clay and shale	8	Feet.	
Coal	7"		
Shaly sandstone	15	Feet.	

LAUREL FORK.

On the left, $\frac{3}{8}$ mile up the fork, $\frac{1}{4}$ mile up the branch, C. E. Gray has a 4-yard entry with bed-section at its face as shown following:

Flag Coal.

Sandstone	3	Feet.
Shale	8"	
Coal	8"	
Shale	4"	
Coal	17"	
Altitude, 1,190.		

On the right of a left branch, $\frac{3}{4}$ mile up the fork, $\frac{1}{8}$ mile up the branch, Aaron Brock has a 1-yard entry into the Haddix bed, giving, under 2 feet of shale, 28

inches of coal, at altitude 1080. The shale has much mica, is soft and sandy, evidently a weathering of sandstone to shale.

In the fork, $1\frac{1}{2}$ miles up it, James Campbell has opened the same bed with the following section:

Haddix Coal.

Soft, friable sandstone.	
Block coal	8"
Splint coal	15"
Block coal	4"
Altitude, 1,090.	

COLWELL FORK.

On the right, $\frac{1}{2}$ mile up Forked-mouth Creek: Altitude of mouth, 855.

On the right, in the road near the mouth of the fork, the stain of the rider to the Fire-clay coal is visible, above a massive sandstone, at altitude 865. As the sandstone is 25 feet or more thick, the Fire-clay coal is probably slightly under the mouth of the fork.

On the left of a right branch, $\frac{1}{4}$ mile up the fork, and also up the branch, Elijah McIntosh has a 15-yard entry into the Flag bed, at altitude 1200, having at its face 34 inches of coal, with 2 inches of shale parting 22 inches from the bottom, as measured at the face, where the roof is a fossiliferous shale. At the mouth of the entry 5 feet of massive sandstone lies on the coal.

In the next branch above on the road to this entry the top of the cliff under the Hazard bed is at altitude 1125.

At the head of a right branch, $\frac{5}{8}$ mile up the fork, $\frac{1}{8}$ mile up the branch, J. M. Colwell has a 4-yard entry of the following bed-section at its face:

Flag Coal.

Shale	10	Feet.
Coal	12"	
Shale	5"	
Coal	18"	
Altitude, 1,210.		

As with the preceding entry a cliff under the Hazard bed is 60 feet under this one and the stain of the Haddix coal shows in the road below at altitude 1100. This is the only place known where the Flag coal has such a covering of shale over it, a common occurrence with the Hazard bed. But the similarity of bed-sections here and in the entries on the branch below this just given, and at Mr. Gray's on Laurel fork, together with their height of 250 feet or more above the Fire-clay coal are regarded as proof positive.

On the right of the next branch, $\frac{3}{4}$ mile up the fork, $\frac{1}{4}$ mile up the branch, a closed entry, under 10 feet of shale, give what is probably the Hazard bed at altitude 1185 as obtained, but actually probably 25 to 30 feet less.

On the right of a right branch, 1 mile up the fork, $\frac{1}{8}$ mile up the branch, below the road as it ascends the hill, Martha Colwell has an incomplete opening, from which the following section was obtained:

Hazard Coal.	
Shale	8 Feet.
Block coal	14"
Splint coal	18"
Block coal	10"
Altitude, 1,160	

Six inches more coal was reported underneath, but was not accessible when visited.

The likeness of this bed-section to that of the Haddix coal at the head of Laurel Fork is almost sufficient for correlation, but the conformity in roof and in altitude with the entry near the head of the left fork of Campbell Creek force the conclusion that this is of the Hazard bed. A large area of coal is available here.

Seven-eighths mile up the creek, on the left, $\frac{1}{8}$ mile up a right branch there, the Tennis Coal Company has started an entry into the Hazard coal at altitude 1175, 35 inches thick at the face, 1 yard in. A seam one foot from the top marks the place of change from block to splint coal which occurs near the head of Colwell Fork. A foot of sandstone shows on top of the coal. About 60 feet higher is a 20-foot cliff which caps the ridge, low here along the main creek.

IVY GAP FORK.

On the right, 1 mile up: Altitude of mouth, 885.

On the right of a right hollow, $\frac{3}{4}$ mile up the fork, $\frac{1}{8}$ mile up the hollow, James Baker has a 5-yard entry into the Flag coal at altitude 1310, having 5 feet of sandstone, 27 inches of coal, including 2 to 4 inches of black slate or bone coal 2 inches from the bottom. The top of a 15-foot cliff is 60 feet below it—altitude 1250.

On the right at the mouth of the next right hollow, $\frac{7}{8}$ mile up the fork, William Baker has a 1-yard entry into the Hazard bed, at altitude 1250. Over the 30 inches of good-looking block coal is 8 feet of shale, on top of which appears a thin coal stain, and just below it is a cliff of the same sandstone as the cliff of the preceding hollow.

On the left of a left branch, $1\frac{1}{8}$ miles up the fork, $\frac{1}{8}$ mile up the branch, John Duff has a covered prospect reported of bed-section as follows:

Hazard Coal.	
Shaly sandstone	3 Feet.
Coal	12"
Black slate	4"
Coal	14"
Altitude, 1,260.	

This "black slate" corresponds with the splint coal of the same bed on Colwell fork.

On the right of the main creek, $2\frac{1}{2}$ miles up it, Stephen Stedham has a covered prospect into the Haddix bed at altitude 1160, 80 feet above the creek.

Above this opening is an 8-yard entry under 3 feet of sandstone, into the Hazard bed with 27 inches of coal at its face, at altitude 1220. The lower half of the coal appears slaty and bony.

Across the creek, on the left, $\frac{1}{8}$ mile up a left branch, Hanson Colwell has a 12-yard entry into the Hazard bed at altitude 1240, with 36 inches of coal at its face. The lower foot or more of the coal looks like dull splint or bony coal like that across the creek, but is reported to burn well. Two feet of massive sandstone cover the bed and 10 feet higher is a 15-foot cliff. Cliffs also show close under each coal bed.

On the right, 3 miles up the creek, Thomas Sizemore has a long entry into the Hazard bed, under sandstone, with 27 inches of coal at its mouth similar to the preceding: Its altitude is 1225.

In the railroad cut at Yerkes 6 inches of coal at altitude 830, 3 feet above the track and under 25 feet of shale is an off-shoot from the Fire-clay coal noted at openings below Yerkes.

On a right branch $\frac{1}{4}$ mile above Yerkes, on the right (of the right fork), $\frac{1}{8}$ mile up, William Campbell has a 12-yard entry into the Flag bed at altitude 1235, having 32 inches of coal at its face, largely fine-looking splint, under two feet of shale and then sandstone. It lies directly on a 20-foot cliff.

On the left (of the left fork), $\frac{3}{8}$ mile from the river, C. A. Baker has a long entry with the following section at its mouth:

Flag Coal.	
Shaly sandstone	5 Feet.
Block coal	9"
Splint coal	15"
Block coal	8"
Altitude, 1,210.	

This entry also is on a cliff and another cliff lies about 80 feet higher. The succession of cliffs show at different heights of the hills along the river as conspicuous escarpments.

WILLARD CREEK.

Altitude of mouth, 800.

On the left, $\frac{1}{4}$ mile up the creek, 5 feet above the road, two seams, probably the upper ones, of the Whitesburg bed appear, between a parting of fossiliferous shale as shown following in conjunction with the Fire-clay coal as found nearly above this exposure and given in an earlier report.

Fire-clay Coal.

Sandstone	5 Feet.
Shale	5 Feet.
Coal	2"
Flint fire-clay	4"
Coal	10"
Clay	4"
Black slate	3"
Clay.	

Altitude, 870.

Whitesburg Coal (in part).

Shaly sandstone	5 Feet.
Black slate	3 Feet.
Coal	9"
Shale	5 Feet.
Coal	8"

Altitude, 830.

Above these exposures is a prominent cliff with its top at altitude 1105.

Twenty-five feet higher is an old prospect into what may be either the Haddix or the Young bed; at altitude 1130, it is 260 feet above the Fire-clay coal.

LITTLE WILLARD CREEK.

On the left, $\frac{1}{4}$ mile up: Altitude of mouth, 810.

On the left, $\frac{1}{4}$ mile up this creek, is a long entry into the Hazard coal under 4 feet of shale exposed. Now abandoned, it still shows about 5 feet of coal at altitude 1185. In the peak of a ridge its area here is probably not over 10 acres.

The durability of the sandstone over the Fire-clay coal in this vicinity is shown not only in the cliffs on either side but also by the fact that the creek has failed to cut through it until below the mouth of Fugate Fork, although its drainage area above is considerable and the descent of the stream sufficient to give it much cutting power.

FUGATE FORK.

On the left of Little Willard Creek, $\frac{3}{4}$ mile up it:
Altitude of mouth, 950.

On the left, $\frac{3}{8}$ mile up, William (formerly Roderick) McIntosh has a now abandoned entry in which a former measurement gave the following:

Hazard Coal.

Shale	2 Feet.
Thin coal.	
Shale	10 Feet.
Coal	6"
Splint coal	24"
Coal	10"
Bony coal	12"
Coal	5"

Altitude, 1,180.

The twelve inches of bony coal appears to be fairly good and the whole should be marketable.

On the left at the mouth of a right hollow, $\frac{1}{2}$ mile up the fork, James Colwell has a 4-yard entry into the Hazard bed at altitude 1185 with 65 inches of coal at its face, the lower 16 inches somewhat bony. Five feet of shale lies on the coal, with a thin coal stain showing in the middle of it.

On the left, $\frac{5}{8}$ mile up, an old stripping of the Haddix bed, long since covered, was reported to have 3 feet of coal, the upper 2 inches cannel, and is at altitude 1120.

On the left of a right hollow, $\frac{3}{4}$ mile up, $\frac{1}{8}$ mile up the hollow, Jack Fugate has a 10-yard entry into the Hazard bed, at altitude 1205, with 62 inches of coal at its face and 5 feet of shale above it. The coal of the lower 10 inches is slightly bony, but apparently not enough so to affect its sale. It is not a rich-looking coal but has some good splint in it.

The hills in these right branches, higher than on the left, give the Hazard bed 100 to 200 feet of covering and a considerable area, which might be attacked from the river opposite the head of this fork.

On the left of Little Willard Creek, $\frac{7}{8}$ mile up it, Henry Fields has a wet entry with the following section at its mouth:

Hazard Coal.

Earth.	
Coal or shale	2 Feet.
Shale	1½ Feet.
Coal	½ Foot.
Shale	5 Feet.
Coal	57"
Bone coal	4"
Coal	6"

Altitude, 1,205.

The upper foot of the 57 inches seems to be poor. The two feet of coal and shale at the top is probably a slip from the Flag bed.

On the right, a mile up, an old prospect into the Haddix coal, 10 feet above a cliff, gives the altitude of the bed as 1165.

On the left of a left branch, $1\frac{1}{8}$ miles up, $\frac{1}{8}$ mile up the branch, G. C. Morgan has a 5-yard entry of the following bed section half way in:

Hazard Coal.

Sandstone	2 Feet.
Shale	1 Foot.
Coal	9"
Shale with coal	6"
Coal	19"
Black slate	6"

Altitude, 1,235.

A streak of bony or slaty coal was found 5 to 8 inches above the black slate.

On the right, $1\frac{1}{4}$ miles up, John W. Morgan has an abandoned entry into the Hazard coal said to be 5 feet thick with the lower foot slaty. Its altitude, 215 feet above the creek, is 1210.

On the left of a right branch at Mr. Morgan's, $1\frac{1}{4}$ miles up, $\frac{1}{8}$ mile up the branch, he has a 3-yard entry into the Haddix coal at altitude 1160. The bed is 42 inches thick here and includes 4 inches of cannel slate 2 inches from the top, leaving an even 3 feet of coal workable. A prominent cliff lies close below it.

On the right of left branch, 2 miles up, $\frac{1}{8}$ mile up the branch, William Jamieson has a wet entry into the

Hazard bed with 64 inches of coal at its mouth, reported of inferior quality: Its altitude is 1215.

On the left, $2\frac{1}{2}$ miles up, William Fields has an 8-yard entry into the Hazard coal at altitude 1235, apparently in a roll, the coal thinning at face and irregular, approximately $2\frac{1}{2}$ feet thick.

Along a branch on the right, $\frac{7}{8}$ mile up main Willard Creek, the following section was obtained in going from the mouth of the branch to a high peak, a half-mile in a nearly straight direction:

High peak	1,240
Base of 25-foot cliff	1,160
Base of 20 feet exposed sandstone	1,090
Haddix entry	1,070
Base of 15-foot cliff	1,005
Base of 40-foot cliff	850
Probable place of Fire-clay coal	845
Mouth of branch	835

From the summit the upper cliff can be seen as a ridge cap rock at intervals in various directions.

The above Haddix entry, belonging to Ellis Willis, is on the right of the branch, $\frac{1}{4}$ mile up and has 34 inches of clean coal at its mouth increased to 38 inches at its face, 10 yards in. It is covered by 5 feet of massive sandstone.

HURRICANE FORK.

On the left, $1\frac{1}{4}$ miles up: Altitude of mouth, 845.

The Fire-clay coal here is probably at altitude about 850, slightly lower than at the mouth of the creek, but from here up stream a decided rise of strata is noted.

From this point also a reduction is found in the interval between the Fire-clay and the Hazard coals from about 300 feet to some 250 feet a mile above, the reduction being indicated on both forks.

In a left hollow at the mouth of Hurricane Fork, on the right, $\frac{1}{8}$ mile up, E. W. Fields has a long entry into the Hazard coal, 40 inches thick, with a knife edge parting 2 inches from the top, as measured at the mouth of the entry. Eight feet of shale are above it. Its altitude is 1145.

BRIER-PATCH (STACY) BRANCH.

On the left, $\frac{1}{2}$ mile up Hurricane Fork: Altitude of mouth, 875.

On the right of this branch at its mouth is the following exposure:

Fire-clay Coal.

Laminated sandstone	5 Feet.
Black slate	
Black flint fire-clay	4"
Coal	8"
Shales (to branch)	10 Feet.
Altitude, 895.	

In a left branch, $\frac{1}{4}$ mile up, the Fire-clay coal shows again, at altitude 900.

On the left of this little branch, $\frac{1}{4}$ mile up it, Mack Morgan has a 6-yard wet entry into the Hazard bed showing at the mouth about 36 inches of coal, under 2 feet of shale, at altitude 1170.

On the right, $\frac{1}{4}$ mile up a left branch, $\frac{1}{2}$ mile up Brier-Patch Branch, H. P. Morgan has a wet entry into the Hazard bed at altitude 1165. Apparently the coal is $3\frac{1}{2}$ to 4 feet thick, but only about $1\frac{1}{2}$ feet was visible. In the dump the coal looked rather poor. The bed has $1\frac{1}{2}$ feet of black slate and coal covering, above which is sandstone.

In the fork at William Standiford's, $\frac{7}{8}$ mile up, a limestone is exposed at altitude 950, some 50 feet above the Fire-clay coal.

On the left at this place is a 15-yard entry with the following section at its face:

Hazard Coal.

Shale	8 Feet.
Coal	3"
Black slate	4"
Coal	35"
Slaty coal	9"
Altitude, 1,155.	

Though well under cover the coal is soft and muddy. The bench of the Haddix coal is very evident 65 feet lower.

On the left, $1\frac{3}{4}$ miles up, Felix Stacy has an 8-yard entry with the following section at its mouth:

Hazard Coal.

Shale	8 Feet.
Coal	2"
Clay	1"
Coal	2"
Cannel slate ..	8"
Coal ..	37"
Altitude, 1,185.	

It is but 40 feet above the branch and a good area is available, but the quality of the coal is doubtful.

Coal taken from Hurricane Fork, $\frac{5}{8}$ mile up it, said to be 6 inches thick, is of the Fire-clay coal bed at altitude 890.

A former report gives the following section as 120 feet above the Fire-clay coal and in this vicinity with no allowance made for inclination of strata. It is evidently of the same bed as the Joseph Hamlin coal of Campbell Creek, there found 90 feet above the Fire-clay coal:

Clay.	
Iron ore	4"
Shale	3"
Coal	5"
Shale	18"
Cannel coal	23"
Clay.	
Altitude, 1,010 (?).	

The cannel was described as rather slaty.

On the right, 1 mile up, Samuel Colwell has two entries, one closed and the other 8 yards in, giving the following bed section at its mouth:

Hazard Coal.

Sandstone.	
Shale	4 Feet.
Cannel slate	2"
Coal	43"
Altitude, 1,180.	

FRIER-CAMP BRANCH.

On the left, $\frac{1}{4}$ miles up Hurricane Fork.

On the left, $\frac{1}{2}$ mile up the branch, 20 feet above it the coal bed about 100 feet above the Fire-clay coal gives the following section, the lower 6 inches not seen:

Shaly sandstone	5 Feet.
Coal	2"
Shale	1½ Feet.
Coal	14"
Altitude, 1,040.	

On the right, $1\frac{1}{4}$ miles up, Samuel Colwell has a 6-yard entry with the following bed section at its face:

Hazard Coal.

Sandstone	5 Feet.
Shale	5 Feet.
Coal	1"
Shale and coal	18"
Coal	6"
Shale	1"
Cannel slate	5"
Coal	38"
Altitude, 1,225.	

The entry is not yet carried to solid coal. Though low in the hill here near the head of the branch the area of coal in this vicinity is small as the hills are low.

A former opening at the head of the fork, "a mile above Samuel Whittaker's" (now Samuel Colwell), gave the following section and analysis by Dr. R. Peter from my sample:

Hazard Coal.

Cannel slate	6"
Clay	6"
Cannel slate	9"
Shale	3"
Coal	45"
Altitude, 1,190.	

Analysis.

Lab. No. 2794.

Moisture	3.96
Volatile combustible matter	32.84
Fixed carbon	52.80
Ash (purplish gray)	10.40
	<hr/>
	100.00
Sulphur	0.722
Specific gravity	1.390
Coke	friable.

"Portions of the sample dull splint coal. Some fibrous coal between the laminae, but no apparent pyrites. Some pieces bright pitch black." The sample was taken from a surface opening and consequently the analysis is too high in ash, but in view of the character of the coal down the creek it may be assumed that the discrepancy is not great.

On a bench 185 feet above this last opening, at altitude 1375, a thick coal bed was reported, probably correctly, as it corresponds nearly with the height of the Hindman bed, opened little more than a mile to the south on Amy Fork of Big Creek.

On the left, 2 miles up Willard Creek, 100 yards above the school house, is exposed the following section 5 feet above the creek:

Fire-clay Coal.

Sandstone.	
Coal	3"
Sandstone	1"
Black slate	12"
Flint fire-clay	7"
Coal	8"
Altitude, 895.	

On the right $2\frac{3}{8}$ miles up, Jerry Combs has a wet entry, having at its mouth 40 inches of coal on 6 inches of black slate containing coal and under 6 feet of shale. Floor and roof are indicative of the Hazard bed, although, at altitude 1150, the opening is but about 240 feet above the Fire-clay coal bed.

BIG BEECH FORK.

On the left, $2\frac{1}{2}$ miles up Willard Creek: Altitude of mouth, 920.

On the right at the mouth of this fork is the following exposure:

Fire-clay Coal.

Sandstone	10 Feet.
Black Slate	8"
Flint fire-clay	9"
Coal	5"
Black-jack	3"
Fire-clay	9"
Black-jack	3"
Shale	1 Foot.
Altitude, 920.	

In this and in the preceding section of the same bed there is some variation in thickness of strata in each exposure.

ROAD FORK.

On the right, $\frac{1}{4}$ mile up Big Beech Fork: Altitude of mouth, 945.

On the right, $\frac{1}{2}$ mile up Road Fork, Samuel Campbell has a 12-yard entry with the following bed section at its face:

Hazard Coal.

Shaly sandstone	3 Feet.
Shale with coal	1½ Feet.
Black slate	5"
Shale	1½ Feet.
Cannel slate	2"
Coal	10"
Shale	1"
Coal	20"
Bone coal	5"
Coal	5"
Black slate	1 or 2"
Altitude, 1,160.	

On the left, $1\frac{1}{8}$ miles up, what appears to be the Fire-clay coal rider has the section following, the shale roof including on or near the coal a band of black slate:

Fire-clay Coal Rider (?).

Sandstone	4 Feet.
Shale	7 Feet.
Coal	3"
Shale	8"
Coal	3"
Shale	1"
Coal	5"
Altitude, 1,015.	

Two such seams of coal occur with others on Whitaker Branch of Big Creek, about 60 feet over the Fire-clay coal. The interval to that coal here is probably not more than half of that.

On the left and left of the road and by it, $1\frac{1}{2}$ miles up, is an old prospect into the Haddix coal, at altitude 1185.

On the right of the gap at the head of the fork, $1\frac{3}{4}$ miles up, John Hoskins has an 8-yard entry into the Flag coal. It contains 31 inches of good block and splint coal under shale roof, with sandstone close above, and is at altitude 1335. With the gap only 20 feet higher and adjacent hills not much higher than that, the area of the coal is small.

LITTLE BEECH FORK.

On the left, $\frac{3}{8}$ mile up Big Beech Fork.

On the right, $\frac{1}{8}$ mile up Little Beech Fork, Elijah Hoskins has a 12-yard entry, with the following bed section, taken 3 yards in:

Hazard Coal.

Shale with thin coals	7 Feet.
Black slate	7"
Shale	6"
Coal	42"
Altitude, 1,145.	

This coal looks fine in the dump, but in the entry the upper part of it seems rather poor. It lies on a big bench and has a long, but narrow, area.

In Big Beech Fork, $\frac{7}{8}$ mile up, is about 6 inches of limestone, at altitude 975, about 60 feet above the Fire-clay coal.

On the right, $1\frac{1}{8}$ miles up, Abijah Hoskins has a 10-yard wet entry with the following section, the coal as reported, probably correctly:

Hazard Coal.

Shale with coal and black slate	3 Feet.
Black slate	5"
Shale	2½ Feet.
Coal	38"
Altitude, 1,160.	

BUBBY ROOT BRANCH.

On the left of Willard Creek, 3 miles up: Altitude of mouth, 955.

On the left of the branch, $\frac{1}{8}$ mile up, an old prospect into the Hazard coal, under 8 feet of shale, still shows $1\frac{1}{2}$ feet of coal, which may be double that thickness or more. Its altitude is 1155, some 15 feet higher than the cliff across the branch.

On the right of a left branch, at its mouth, $4\frac{1}{2}$ miles up the creek, Harris Couch has a 5-yard entry, with bed section as follows:

Hazard Coal.

Shale	8 Feet.
Coal	13"
Shale	11"
Coal	24"
Altitude, 1,185.	

This entry is 15 feet above a prominent cliff.

On the right of a right branch, $4\frac{1}{2}$ miles up the creek, $\frac{1}{4}$ mile up the branch, Andrew Stedham has an 8-yard entry into what is probably the Flag bed, with 32 inches of coal at its face and 4 feet of sandstone over it. Its altitude is 1235.

On the left of the same branch, opposite the preceding, Frank Campbell has an 8-yard entry into the same bed with sandstone roof and 38 inches of coal at its face. Its altitude is 1225.

Considerable prospecting seems to have been done in this neighborhood in order to get coal for local use, but so far as learned all openings excepting those given were abandoned.

On the right of the river, $\frac{1}{2}$ mile above Willard Creek, $1\frac{1}{2}$ miles above Yerkes, Benjamin Fugate has a 2-yard entry with the following section, not uniform:

Fire-clay Coal.

Sandstone	4 Feet.
Shale	1 Foot.
Sandstone	4"
Shale	3"
Coal	3"
Flint fire-clay	3"
Coal	9"
Shale	3"
Coal	3"
Shale	12"
Coal	4"

Altitude, 875.

From this bed to the Whitesburg coal, about 45 feet lower, there appears to be only shaly sandstone.

On the right, $1\frac{3}{4}$ miles above Yerkes, Mr. Fugate has a 12-yard entry, with 57 inches of coal at its mouth, the lower 10 inches slightly slaty, and with 2 inches of bone in the middle. Eight feet of shale with a coal stain on top overlie the coal, which is of the Hazard bed, at altitude 1190. A cliff below the entry with its top at altitude 1125 underlies the Haddix coal.

On the left of a right branch, about $4\frac{3}{4}$ miles above Yerkes, $1\frac{3}{8}$ miles below Typo, $\frac{1}{4}$ mile up the branch, Moses Felton has a long entry, under 5 feet of shale, with 60 inches of coal 5 yards in. This is of the Hazard bed, at altitude 1175.

On the right of the river (looking up it) $\frac{7}{8}$ mile below Typo, Walter Couch has a 15-yard entry into the Hazard bed, at altitude 1185, having 58 inches of coal,

measured 4 yards in, under 10 feet of shale, with 5 inches of coal in the middle of it.

The cliff under the Haddix coal shows prominently here with its top at altitude 1120.

BEN COUCH BRANCH.

On the right of the river, $\frac{5}{8}$ mile below Typo.

On the left, $\frac{1}{2}$ mile up the branch, a 2-yard entry gives the following:

Haddix Coal.

Sandstone	4 Feet.
Coal	1"
Cannel slate	1"
Coal	26"

Altitude, 1,140.

The coal, excellent in appearance, is largely splint coal.

At the face of a 20-yard entry above the preceding, under 8 feet of shale, the Hazard bed gives 58 inches of coal at altitude 1190.

While these two beds barely cut or overreach the tops of the hills immediately against the river, there is good area for mining here on both sides of the branch.

BIG CREEK.

Altitude of mouth, 810.

Several thin seams of the Whitesburg coal show in shaly sandstone and shale cliffs on the left to a height of some 30 feet above the river for the first $\frac{1}{4}$ mile up the creek. Similar to the exposures on Messer Branch, opposite Hazard, they were not examined in detail.

On the right, $\frac{1}{2}$ mile up the creek, a bench at altitude 1000 seems to indicate the place of the coal bed 100 feet above the Fire-clay coal. At altitude 1140, the top of a 40-foot cliff, is the place of the Haddix coal, while at altitude 1190, near the top of the hill, is an old entry, now closed, into the Hazard bed on top of a 20-foot cliff, under which may possibly be the Young bed.

BROWN FORK.

On the left, $\frac{3}{4}$ mile up Big Creek: Altitude of mouth, 935.

In the fork, $\frac{3}{8}$ mile up, is a thin seam of the Whitesburg coal, while on the right, 10 feet higher, at altitude 855, the upper seam of the bed is exposed with 10 inches of coal under 2 feet of black slate, with shale above and below.

On the left by the road, $\frac{3}{4}$ mile up the fork, a foot of coal slipped from the Fire-clay coal bed lies on a foot of black slate, at altitude 905. Below this are 30 feet of shales and then 20 feet of sandstone to the fork.

CURLEY FORK.

On the left, 1 mile up Brown Fork: Altitude of mouth, 860.

On the left, $\frac{3}{8}$ mile up, by the road, part or all of the Fire-clay coal bed is exposed with coal 8 inches thick under 4 feet of black slate and upon 5 feet of common fire-clay, at altitude 945.

The stain of the Haddix coal shows in the road, on the left, $1\frac{1}{8}$ miles up, at altitude 1190, 5 feet above a 20-foot cliff.

From that stain to two entries into the Hazard bed, above the road, $1\frac{1}{8}$ and $1\frac{1}{4}$ miles up, strata appear to be mostly sandstone. Of these two entries, belonging to William Combs, the latter, under 20 feet of sandstone, has, at its face, 30 yards in, 54 inches of excellent coal, excepting 3 inches a foot from the bottom, which is bone coal, apparently detracting little from the value of the whole. The altitude is 1255.

On the left, by the road, $1\frac{1}{2}$ miles up, an old prospect developed only thin coal in the Flag bed, at altitude 1310. Sandstones in cliffs are above and below all three of these beds.

On the right of the road and left of the fork, below this Flag opening, a wet entry into the Hazard bed has at its mouth about 42 inches of coal, the lower 12 inches hidden in water. Its altitude is 1260. Three feet of shale intervenes between the coal and sandstone above it.

On the left, $1\frac{3}{8}$ miles up the fork, the Haddix bed has been opened and now shows under 4 feet of sandstone, about $1\frac{1}{2}$ feet of coal, with possibly $2\frac{1}{2}$ feet more hidden. Its altitude is 1200.

On the right, 2 miles up Curley Fork, Wise Combs has a 5-yard entry into the Haddix coal, giving, at its mouth, 38 inches of coal, under sandstone roof, at altitude 1170.

Above this he has a 10-yard entry into the Hazard bed, which, 2 yards in, has, under sandstone, 48 inches of coal, including 3 inches of bone coal, 8 inches from the bottom. Its altitude is 1230.

On the right, $2\frac{1}{8}$ miles up, James Combs has a 5-yard entry into the Haddix bed, at altitude 1175, under 7 feet of sandstone, with about 34 inches of coal at the mouth and 38 inches at the face.

On the left, $2\frac{1}{4}$ miles up, 5 feet above Curley fork, Mr. Combs has a wet entry into the Haddix coal, about 47 inches thick at the mouth, covered by 10 feet of very soft, friable sandstone. The altitude is 1180.

Across, on the right of the branch, he has a 6-yard wet entry into the Hazard coal, at altitude 1240, under 5 feet of sandstone, with 31 inches of coal, the bottom 6 inches not seen and the bone coal apparently present.

CAMPBELL BRANCH.

On the right, $1\frac{3}{4}$ miles up Brown Fork: Altitude of mouth, 900.

On the left, $\frac{1}{4}$ mile up a left branch, $\frac{1}{8}$ mile up Campbell Branch, an unfinished prospect into the Hazard bed, at altitude 1210, shows over 3 feet of coal, and is reported to be 4 feet thick. Overlying the coal is 3 feet of shale, upon which is massive sandstone.

On the left, $\frac{1}{4}$ mile up Campbell Branch, Henry Campbell has a 16-yard entry into the Flag bed with coal varying from 40 to 45 inches at its face, and with 10 feet of sandstone over it. Its altitude is 1250.

On the right, $\frac{5}{8}$ mile up the branch, John Campbell has a 16-yard entry into the Flag bed, at altitude 1280, having 48 inches of coal 12 yards in. An inch of bone coal 13 inches from the bottom is included. Overlying the coal is 5 feet of sandstone.

On the left, $\frac{3}{4}$ mile up the branch, Milton Campbell has an entry just starting into the Hazard coal, having 54 inches of coal under 8 feet of shale, at altitude 1215.

An ample area of both beds is available for mining here.

On the right, $\frac{1}{8}$ mile up a left hollow, $1\frac{7}{8}$ miles up Brown Fork, William Couch heirs have a 10-yard entry into the Hazard Bed, at altitude 1200, with 45 inches of coal at its mouth, under 8 feet of sandstone. A half-inch clay parting 17 inches from the bottom probably disappears underground.

A ledge of thin limestone was found below the entry at altitude 1120 and the Fire-clay coal is probably at about 930, as indicated by the sandstone here under which it lies.

On the left, $2\frac{1}{4}$ miles up the fork, is the following exposure some 20 feet above the stream:

Fire-clay Coal.

Sandstone	.....	10	Feet.
Black slate	.....	4	Feet.
Coal	.....	2"	
Shale	.....	1"	
Coal	.....	10"	
Clay	.....	1"	
Coal	.....	10"	
Altitude, 945.			

The lower parting indicates the place of the usual flint fire-clay, as proved by exposures 3 miles up the fork, given below. This is one of the very rare instances in Southeastern Kentucky where the peculiar characteristic of the parting is not readily recognized.

On the right, $2\frac{1}{2}$ miles up the fork, Alfred Couch has a 3-yard entry, under sandstone, into the Flag coal, at altitude 1275, giving 46 inches of coal, including an inch of bone 18 inches from the bottom.

On the left, 3 miles up, and on the right at the mouth of Sheep Hollow Branch, just beyond, are the following exposures:

Fire-clay Coal.

Sandstone	.....	20	Feet...	8	Feet.
Black slate	.....			1½	Feet.
Coal	.....	11"		9"	
Flint fire-clay	.....	5"		2"	
Coal	.....	7"		10"	
Altitude	.....	975		980	

The upper half of the 5-inches parting is black and the lower half the usual brown.

SHEEP HOLLOW BRANCH.

On the right, 3 miles up the fork: Altitude of mouth, 980.

On the head of the branch, $\frac{1}{2}$ mile up, John Campbell has a 5-yard entry into the Hazard bed, at altitude 1305, with, at its mouth, 48 inches of coal and a shale parting of about 2 inches 7 inches from the bottom. Upon it is 3 feet of sandstone.

On a left branch at Mr. Campbell's house, $3\frac{1}{4}$ miles up the fork, he has a 12-yard entry into the same bed at altitude 1295, with 46 inches of coal at its mouth, and but 38 inches mined at the face, some coal being left in the bottom, probably because of water. The bed is covered by 6 inches of black slate upon which is exposed 3 feet of sandstone.

On the right, $\frac{1}{4}$ mile up a right branch, $3\frac{1}{2}$ miles up the fork, Mark Standiford has a 9-yard entry into the Hazard bed, at altitude 1230, with about 47 inches of coal, as measured half way in. Upon the coal is 8 feet of shale.

On the left, $\frac{1}{4}$ mile up a left branch, $4\frac{1}{4}$ miles up the fork, William Creech has an 8-yard entry into the Flag bed, at altitude 1310, which has, at its mouth, 36 inches of coal under 4 feet of sandstone.

BULL FORK.

On the right, $4\frac{1}{2}$ miles up Brown Fork: Altitude of mouth, 1070.

On the right, $\frac{1}{2}$ mile up Bull Fork, W. Turner has an 8-yard entry with the following section at its mouth,

4 inches of the bottom coal at the face apparently left for drainage:

Flag Coal.	
Sandstone	4 Feet.
Coal	14"
Shale	4"
Coal	40"
Altitude, 1,340.	

On the right of Brown Fork, $4\frac{3}{4}$ miles up, Matt Rich has a 3-yard partly covered entry with the Flag bed, at altitude 1350. The bed, under 10 feet of sandstone, appears to be 4 or 5 feet thick.

The Hazard bench shows plainly 60 feet under this and the preceding opening with the cliff directly under it here, but on Brown Fork generally bench and cliffs are far less conspicuous than on streams given on the preceding pages of this report.

Both the Hazard and the Flag beds give abundant area for mining in this vicinity.

On the right, $\frac{1}{4}$ mile up a right branch, 1 mile up Big Creek, Silas Crawford has a wet entry with the following section at its mouth, the bottom of the coal in water not seen:

Hazard Coal.	
Shale	8 Feet.
Coal	2"
Shale	3 Feet.
Coal	6"
Shale with coal	18"
Coal	26"
Clay	1"
Coal	33"
Altitude, 1,200.	

The upper 6 inches of the 26 inches seen is left to support the otherwise very weak roof. There is a good area of the coal here, but its quality was not ascertained.

COAL HARBOR BRANCH.

On the right, $1\frac{1}{4}$ miles up Big Creek: Altitude of mouth, 845.

Along the road up this branch to Little Willard Creek, a coal stain (100 feet above the Fire-clay coal) was noted at altitude 1035. Another at altitude 1120 is probably a slip from the Haddix bed, which shows its stain at altitude 1140, also probably below its normal level.

On the right of the road and branch, $\frac{1}{2}$ mile up, an abandoned entry into the Hazard coal, at altitude 1220, under 8 feet of shale, shows 3 feet of coal and a probable thickness of bed of 4 or 5 feet. The gap to Little Willard Creek, $\frac{1}{4}$ mile beyond, is 35 feet lower than the entry and the area of coal in this vicinity is not great, but sufficient for mining if the coal proves satisfactory in quality.

At $1\frac{1}{2}$ miles up Big Creek one seam of the Whitesburg coal, under black slate, goes below drainage at altitude 850.

At 2 miles up another seam of the same bed, 12 inches of coal, under 2 feet of shale, goes below drainage at altitude 870, while a third, probably the upper one, is exposed on the left, 20 feet higher, 8 inches of coal under sandstone. This goes under $2\frac{1}{2}$ miles up.

In a rock house on the right, $\frac{1}{8}$ mile up a right branch, $2\frac{1}{8}$ miles up Big Creek, is the following exposure:

Fire-clay Coal.	
Sandstone	8 Feet.
Shale	1 Foot.
Black slate	1 Foot.
Flint fire-clay	4"
Coal	11"
Fire-clay.	
Altitude, 925.	

On the right, $\frac{3}{4}$ mile up the same branch, an unfinished prospect shows coal of the Flag bed, at altitude 1260, under 20 feet of sandstone.

On the left, $\frac{1}{8}$ mile up a left hollow, $2\frac{3}{8}$ miles up the creek, a prospect into thin coal (about 100 feet over the Fire-clay coal) has been made at altitude 1025.

Above this prospect Granville Fields has a 15-yard entry with the following section 3 yards in:

Flag Coal.

Sandstone	4 Feet.
Coal	34"
Bone coal	3"
Coal	2"
Altitude, 1,265.	

On the left, $2\frac{3}{4}$ miles up the creek, Fulton Fields has a closed entry into the Hazard bed, under shale, said to have 4 feet of coal. Its altitude is 1210.

Above this is a long entry into the Flag bed with 37 inches of coal 5 yards in, under sandstone, at altitude 1260.

The Fire-clay coal shows in a slip on the left, 3 miles up, at altitude 925.

AMY FORK.

On the right, 3 miles up Big Creek: Altitude of mouth, 886.

On the left, $\frac{1}{4}$ mile up the fork, Jerry Wells has a prospect, under 5 feet of sandstone, into the Flag bed at altitude 1285, apparently $4\frac{1}{2}$ to 5 feet thick, with 3 feet of coal visible.

On the left at creek level is the following exposure:

Fire-clay Coal.

Sandstone	5 Feet.
Black slate	2 Feet.
Coal	33"
Bone coal	2"
Coal	2"
Altitude, 1,290.	

On the right, $\frac{1}{4}$ mile up a right branch, $\frac{3}{8}$ mile up Steep Field Branch, Rufus Fields has an 8-yard entry, the section of which with analysis for the Survey of my recent sample from the face follows:

Flag Coal.

Massive sandstone	10 Feet.
Coal	30"
Slaty coal	2"
Coal	12"
Fire-clay.	
Altitude, 1,330.	

Analysis.

Lab. No. G-3675.

Moisture	1.90
Volatile combustible matter	37.97
Fixed carbon	49.43
Ash	10.70
<hr/>	
	100.00
Sulphur	1.08
B. T. U.	13,372.

The analysis shows a poor coal, but the lower 14 inches, which is the bearing-in coal, has, as indicated in sampling, a much larger proportion of ash than the upper $2\frac{1}{2}$ feet. As the bearing-in coal goes mostly to slack an excess of ash in it is of little importance, and the remaining coal should stand well in marketing. The upper seam has some splint coal.

On a right branch, $\frac{3}{4}$ mile up Steep Field Branch, on the right of its left fork, and $\frac{1}{2}$ mile from main Steep Field Branch, Levi Couch has a 12-yard entry into the Flag coal at altitude 1380, giving, under sandstone, 36 inches of coal 5 yards in. This bed has some 200 feet of covering in this region giving ample area for mining operations.

In Amy Fork, $1\frac{3}{4}$ miles up, altitude 1040, is black slate about 10 feet over the Fire-clay coal rider or split from the Fire-clay coal noted $\frac{1}{8}$ mile up Steep Field Branch.

On the right at this point, Bud Couch has a 25-yard entry into the Flag Coal at altitude 1340, under sandstone, with 39 inches of coal at 2 and at 20 yards in. The coal is hard at the bottom, but becomes rather softer a foot up: Its cleavage is irregular.

On the right, $1\frac{7}{8}$ miles up, a coal stain 8 inches thick, on 4 feet of shale marks the place of the bed 100 feet above the Fire-clay coal, from which it is figured that that bed is about 40 feet below drainage here.

Limestone shows in the road just beyond the coal stain at altitude 1120, but it may have slipped somewhat from its normal position.

On the right of a right branch, 2 miles up, Henry Fields has a 15-yard entry with bed section and analysis by the Survey of the coal, from my recent sample taken at the face, as follows:

Flag Coal.

Massive sandstone	10 Feet.
Coal	39"
Fire-clay.	
Altitude, 1,340.	

Analysis.

Lab. No. G-3674.

Moisture	2.10
Volatile combustible matter	38.50
Fixed carbon	53.06
Ash	6.34
	100.00
Sulphur	.83
B. T. U.	14,229

The coal when sampled seemed to be rather slaty, especially the lower 4 inches, but that in the dump gave no such indication nor does the analysis show it seriously detrimental. Although well up toward the top of the hill there is still a good workable area of the bed.

Sixty feet below the entry is the bench of the Hazard bed and 15 feet below that the top of a 40-foot cliff above the Haddix bed.

On John Fields' land in this vicinity, but with definite location not now known, the Hindman bed was opened for the Survey by Mr. Profitt and the lower 36 inches of coal was sampled by him. The section of the bed and analysis of the outcrop coal by Dr. R. Peter follows:

Hindman Coal.

Sandstone.	
Cannel coal	6"
Shale	10"
Coal	19"
Shale	1"
Coal	36"
Altitude, 1,410 (?)	

Analysis.

Lab. No. 2,783.

Moisture	3.50
Volatile combustible matter	35.30
Fixed carbon	53.14
Ash	8.06
	100.00
Sulphur	1.035
Specific gravity	1.333
Coke	dense.

"A weathered sample of splint coal. Some fibrous coal between the thin laminae but no appearance of pyrites. Some ferruginous incrustation." The rider of cannel coal is not known to it elsewhere. The ridges here are too low and narrow to furnish any very great amount of coal from this bed, but there is sufficient to warrant working it when transportation facilities are supplied to the lower beds. The altitude as given above is probably 50 to 100 feet too low.

On the left of Amy Fork at the mouth of the branch just noted, limestone shows 10 feet above it (possibly slipped from a higher level), presumably about 50 feet above the Fire-clay coal.

The black slate in the fork, $1\frac{3}{4}$ miles up, appears in it again at $2\frac{1}{4}$ miles up and at $2\frac{3}{8}$ miles up, nearly, the limestone, 10 feet higher and fossiliferous here, shows at the branch at altitude 1100. It is but 10 inches thick and rests on a layer of hard sandstone 2 feet thick.

On the left, $\frac{1}{4}$ mile up a right branch, $2\frac{3}{8}$ miles up the fork, Walter Fields has a 1-yard entry into the Flag bed with solid coal as given following:

Flag Coal.

Sandstone.	
Coal	10"
Clay	1"
Coal	29"
Black slate.	
Altitude, 1,350.	

The bed has a northeasterly dip of some 10% as at the entry next given, but there is nothing in the topography to indicate more than a very narrow limit to such excessive inclination of strata.

On the left, 3 miles up Amy Fork, and 50 feet above it, Cady Shepherd has a 10-yard entry on a bench 50 feet above the fork, under 10 feet of argillaceous sandstone, into the Hazard bed probably, at altitude 1290. The coal, 37 inches thick at the face of the entry, is bright and hard excepting toward the bottom where it is somewhat softer.

Correlation here is quite uncertain, the dip of the coal 10% in the entry but not so indicated outside, introducing a factor of unknown importance. The bed section is so nearly like those of the preceding entry given and of that farthest up Steep Field Branch that correlation with those would be justified, but that the height and occurrence on a bench (which is not apt to be the case with the Flag coal), indicate the Hazard bed.

Near the bottom of fairly high hills the bed has abundant area, as may be the case with the Hindman bed also.

BOAR BRANCH.

On the left, 3½ miles up Big Creek: Altitude of mouth, 895.

On the right, ¼ mile up the branch, at the head of a right drain, Mrs. Charles Fields has a 6-yard entry with the following section at its face:

Hazard Coal.

Shale	1 Foot.
Coal	2"
Shale	2"
Coal	57"
Altitude, 1,220.	

This entry, ½ mile above Amy Fork, in connection with one into the same bed at altitude 1210, ¼ mile below the fork, gives excellent opportunity for finding the interval between it and the Fire-clay coal at the mouth of Amy Fork, which, by barometer, is 290 feet.

Black slate in square blocks in the creek 4 miles up, at altitude 905, is about 30 feet below the Fire-clay coal.

On the right, 4¼ miles up, Wilson Baker has a 25-yard entry into the Hazard coal at altitude 1225, giving at its face 58 inches of clean coal under shale.

In the creek, 4½ miles up is a foot or two of limestone at altitude 920, about 20 feet below the Fire-clay coal.

WHITTAKER BRANCH.

On the right, 4⅞ miles up Big Creek: Altitude of mouth, 927.

On the left, ⅓ mile up, are thin coals at altitude 960 and 975, the latter over black slate showing also, on the same level, ¼ mile up and in the branch. On the left, ¼ mile up, are two coals of 3 inches each, in shale, at altitudes 990 and 1010. One or more of these four seams, ranging from 20 to 70 feet above the Fire-clay coal, doubtless represents its rider. The remainder and included strata, apparently mostly shale, are not intrusions thickening the series, but occupy the place, in part, of sandstone usually found at this horizon.

Again on the left, ¼ mile up the branch, limestone appears at altitude 1115, and above that Peter Whittaker has a 25-yard entry into the Hazard bed at altitude 1230, having 57 inches of coal at its face and reported to have 3 or 4 inches more coal under a parting at the bottom. It has 4 feet of shale covering under sandstone.

On the right at the school house, 5¼ miles up Big Creek, is the following section:

Sandstone ..	10 Feet.
Shale	4 Feet.
Black slate	1 Foot.
Coal	1 Foot.
Mostly shale	15 Feet.
Sandstone	20 Feet. (to creek).
Altitude, 975.	

On the right, $5\frac{1}{2}$ miles up, R. B. Fields has a 10-yard entry into the Flag bed at altitude 1225, with 55 inches of coal at its face, and reported 11 inches of coal under 2 inches parting beneath. The roof is shale.

In the creek, $5\frac{3}{8}$ miles up, the Fire-clay coal is at altitude 945. A pit from which the coal was taken is about 2 feet deep and is said to have 2 feet of coal, and from indications down the creek it is unlikely that the bed here amounts to much.

On the left at this point, R. B. Fields has an abandoned entry into the Hazard coal, at altitude 1245, under 10 feet of shale. The coal at the mouth of the entry is entirely covered, but the dump shows cannel coal present there.

WOLF BRANCH.

On the right, $5\frac{7}{8}$ miles up: Altitude of mouth, 955.

One of the thin seams of coal found low down on Whittaker Branch shows $\frac{1}{2}$ mile up this branch and in it, 8 inches thick, at least, and possibly considerably more, at altitude 1020.

On the right of the branch, $\frac{3}{4}$ mile up, the Combs heirs have a long entry with the following section at its mouth, the lower 5 inches in water and not seen:

Hazard Coal.

Sandstone	2 Feet.
Covered	5 Feet.
Shale	2 Feet.
Coal and shale	4"
Shale	6"
Coal	5"
Altitude, 1,220.	

In Big Creek, $6\frac{1}{4}$ miles up it, is another pit sunk into coal at altitude 960, reported without parting and 47 inches thick. If such is the case and it is of the Fire-clay coal bed, as is most probable, it augurs well for mines near Hazard driving in this direction, though, with the variations shown in the bed farther down the river and with the bed known to be thin south and west from here full reliance should not be placed on this one favorable indication.

BENS BRANCH (ORCHARD HOLLOW).

On the left, $6\frac{1}{4}$ miles up: Altitude of mouth 975.

On the right, $\frac{1}{4}$ mile up the branch, Andrew Brown has a new opening into the Hazard bed at altitude 1235, showing about 5 feet of coal under one foot of shale. It is on an unusually broad bench.

NIGGER (JENNY LICK) BRANCH.

On the left, $6\frac{3}{8}$ miles up Big Creek: Altitude of mouth, 980.

On the left, $\frac{1}{4}$ mile up, Irvine Eversole has a 4-yard entry into the Hazard coal at altitude 1270, giving, half way in, 58 inches of coal, under 4 feet of shale.

On the left, 1 mile up, Irvine (formerly Alfred) Eversole has a 6-yard entry with the following bed section as given in a previous report. The entry is now closed but its covering is exposed:

Hazard Coal.

Shale	4 Feet.
Thin coal	
Shale	3 Feet.
Coal	44"
Shale	2"
Coal	18"
Altitude, 1,230.	

On the right, $6\frac{3}{4}$ miles up Big Creek, 280 feet above it, Matt Granover (formerly Alfred Eversole), has a 10-yard entry with the following section at its face, to which should probably be added 4 to 6 inches of coal at the bottom supposed to be left for drainage. Forty feet higher is the Flag bed containing cannel coal, but it appears never to have been opened in this vicinity.

Hazard Coal.

Sandstone	8 Feet
Coal	2"
Shale	2 Feet.
Coal	54"
Altitude, 1,265.	

This is all good, clean-looking coal.

A former measurement of the same bed in a pit on a spur in the close vicinity gave 62 inches of coal and 10 inches parting 16 inches from the bottom, but as the parting and bottom coal were in water and the floor somewhat uncertain the lower thicknesses may need correction.

JACK'S BRANCH.

On the right, $7\frac{1}{8}$ miles up: Altitude of mouth, 997.

A quarter mile up Jack's Branch to Minyard branch on the right, and on the left, $\frac{1}{4}$ mile up the latter, Elihu Minyard has a closed entry into the Hazard bed, having 4 or 5 feet of coal, 4 feet visible, at altitude 1245. On the coal are 5 feet of shale overlain by sandstone.

BUFFALO FORK.

On the left, $7\frac{3}{4}$ miles up Big Creek: Altitude of mouth, 1025.

On the right of the branch at its mouth is coal at altitude 1035, said to be 2 feet thick.

On the right, $\frac{1}{8}$ mile up, are 12 inches of coal under 4 feet of sandstone at altitude 1065. The bed 100 feet above the Fire-clay coal appears here to be separated into two parts by 30 feet of shale principally.

On the left, $\frac{1}{8}$ mile up, Link Eversole, Jr. has a 4-yard wet entry into the Hazard bed at altitude 1215, having, under shale, about 5 feet of coal.

On the right, $8\frac{1}{4}$ miles up Big Creek, John Eversole has a closed entry into the Hazard bed at altitude 1315.

On the left, 9 miles up, Link Eversole has a 12-yard entry with the following section, as obtained, the upper half at its face and the lower half at its mouth:

Hazard Coal.

Sandstone	3 Feet.
Coal	22"
Clay	2"
Coal	27"
Shale	3"
Coal	4"
Altitude, 1,315.	

A broad bench marks the outcrop of this bed at nearly every opening down the creek, and this together with the uniformity in altitudes serves for determination of the correlation of this and of the following opening in disregard of the differing bed sections and roofs.

The entry is 170 feet above the creek here.

Bearing to the left from Link Eversole's, $9\frac{3}{4}$ miles up Big Creek to a branch on the right at the "Long Rockhouse," and on the left $\frac{1}{8}$ mile up the branch, 10 feet above it, is a 4-yard entry, partly closed, having the following section:

Hazard Coal.

Sandstone	4 Feet.
Coal	23"
Clay	2"
Shelly coal and clay	$1\frac{1}{2}$ Feet.
Clay	$1\frac{1}{2}$ Feet.
Coal	36" (?)
Altitude, 1,295.	

The lower seam, measured in $11\frac{1}{2}$ feet of water on a previous visit, may possibly be not clean coal. The shelly coal and clay were so interleaved as to make useless any attempt to separate measurements. At the outcrop the shelly coal was not apparent, and the prospect is therefore favorable that on farther entrance the clay interleaved with the coal will disappear quickly. In fact, the numerous entries into this bed on Big Creek, as well as others across the ridge on Macies Creek, show that this opening has developed abnormal conditions, besides which an apparent roll shows in the entry, giving another reason for believing such conditions confined to narrow limits. The two partings in the Link Eversole entry, however, indicate some change of character of the bed about the head of the creek.

On the right at the head of this branch, $\frac{1}{2}$ mile up it, an unfinished prospect into what may be of the Hindman bed, though probably too high for it, at altitude 1575 shows about $3\frac{1}{2}$ feet of coal under 5 feet of shale. The opening is 15 feet above the gap there to Macies Creek.

Along the dividing ridge to the right near a bridle-path across it the Hindman bed shows a stain of 5 to 6 feet thickness at altitude 1595. Though high in the hill the rise of peaks 300 to 400 feet higher may give attractive areas for mining when transportation to lower beds is provided.

**RESULTS OF SPIRIT LEVELING IN KENTUCKY
FOR THE YEARS 1898 TO 1913, INCLUSIVE.**

**Co-operative Work Between the U. S. Geological Survey
and the Kentucky Geological Survey for the
Years 1902 to 1913, and Work of the
U. S. Geological Survey for
the Years Preceding
1902.**

FROM BULLETIN 554, U. S. GEOLOGICAL SURVEY

R. B. MARSHALL, Chief Geographer.

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**RESULTS OF SPIRIT LEVELING IN KENTUCKY
FOR THE YEARS 1898 TO 1913
INCLUSIVE.**

INTRODUCTION.

Co-OPERATION.—The State of Kentucky contributed financially to this work during the years 1902 to 1913, inclusive, and was represented by C. J. Norwood, director of the Kentucky Geological Survey, from 1902 to 1911, and by J. B. Hoeing, director, in 1912 and 1913.

PERSONNEL.—The field work during the years 1898 to 1902, inclusive, was done under the direction of J. H. Renshawe, geographer; during 1903 to 1905, inclusive, under H. M. Wilson, geographer; during 1906 and 1907 by Frank Sutton, geographer; and during 1908 to 1913, inclusive, under W. H. Herron, geographer. The work since January, 1908, was done under the general direction of R. B. Marshall, chief geographer. Credit is given to the levelmen in the introductions to the several lists. The office work of computation, adjustment, and preparation of lists was done mainly by S. S. Gannett, geographer, under the general direction of E. M. Douglas, geographer.

CLASSIFICATION.—The elevations are classified as precise or primary, according to the methods employed in their determination. For precise-level lines instruments and rods of the highest grade are used. Each line is run both forward and backward, and every precaution is taken to guard against error. The allowable divergence between the forward and the backward lines in feet is represented by the formula $0.017\sqrt{D}$, in which D is the distance in miles between bench marks. For primary lines standard Y levels are used; lines are run in circuits or are closed on precise lines, with an allowable closing error in feet represented by $0.05\sqrt{D}$, in which D is the length of the circuit in miles, sufficient care being given

to the work to maintain this standard. For leveling of both classes careful office adjustments are made, the small outstanding errors being distributed over the lines.

BENCH MARKS.—The standard bench marks are of two forms. The first form is a circular bronze or aluminum tablet $3\frac{1}{2}$ inches in diameter and one-fourth inch thick, having a 3-inch stem, which is cemented in a drill hole in solid rock in the wall of some public building, a bridge abutment, or other substantial masonry structure. The second form, used where masonry or rock is not available, consists of a hollow wrought-iron post $3\frac{1}{2}$ inches in outer diameter and 4 feet in length. The bottom is spread out to a width of 10 inches in order to give a firm bearing on the earth. A bronze or aluminum-bronze cap is riveted over the top of the post, which is set about 3 feet in the ground. A third style of bench mark, with abbreviated lettering is used for unimportant points. This consists of a special copper nail $1\frac{1}{2}$ inches in length driven through a copper washer seven-eighths inch in diameter. The tablets as well as the caps on the iron posts are appropriately lettered and co-operation by States is indicated by the addition of the State name.

The numbers stamped on the bench marks described in the following pages represent the elevations to the nearest foot as determined by the levelman. These numbers are stamped with $\frac{3}{16}$ -inch steel dies on the tablets or post caps, to the left of the word "Feet." The office adjustment of the notes and the reduction to mean sea-level datum may so change some of the figures that the original markings are 1 or 2 feet in error. It is assumed that engineers and others who have occasion to use the bench-mark elevations will apply to the Director of the United States Geological Survey, Washington, D. C., for the adjusted values, and will use the markings as identification numbers only.

DATUM.—All the United States Geological Survey elevations are referred to mean sea level, which is the level that the sea would assume if the influence of winds and tides were eliminated. This level is not the elevation determined from the mean of the highest and the lowest tides, nor is it the half sum of the mean of all the high tides and the mean of all the low tides, which is called the half-tide level. *Mean sea level is the average*

height of the water, all stages of the tide being considered. It is determined from observations made by means of tidal gages placed at stations where local conditions, such as long, narrow bays, rivers, and like features, will not affect the height of the water. To obtain even approximately correct results these observations must extend over at least one lunar month, and if accuracy is desired they must extend over several years. At ocean stations the half-tide level and the mean sea level usually differ but little. It is assumed that there is no difference between the mean sea level as determined from observations in the Atlantic Ocean, the Gulf of Mexico, or the Pacific Ocean.

The connection with tidal stations for bench marks in certain areas that lie at some distance from the sea coast is still uncertain, and this fact is indicated by the addition of a letter or word to the right of the word "Datum" on tablets or posts. For such areas corrections for published results will be made from time to time as the precise-level lines of the United States Geological Survey or other Government organizations are extended.

The following results of spirit leveling are in agreement with the 1907 adjustment of precise leveling by the Coast and Geodetic Survey except as modified in the northern part of the State by an adjustment made in 1912 by the Coast and Geodetic Survey of the precise-level lines from Georgetown, Ky., via Louisville, Ky., Mitchell and Terre Haute, Ind., to Oakland, Ill., run by the United States Geological Survey; from Lawrenceburg, Ind., along the Ohio River to Cairo, Ill., run by the United States Corps of Engineers; from Terre Haute, Ind., along Wabash River to Shawneetown, Ill., run by the United States Corps of Engineers; and from Duquoin to Shawneetown, Ill., run by the United States Geological Survey. These lines have been fitted to the precise level net, the elevations at Georgetown, Ky., Lawrenceburg, Ind., Cairo, Duquoin, and Oakland, Ill., being held at the values given by the 1907 adjustment. The elevations of bench marks in other portions of Kentucky remain as determined by the 1907 adjustment, and are likely to be changed but slightly by any future adjustment.

PRECISE LEVELING.

BREATHITT, CLARK, FAYETTE, LEE, POWELL, AND WOLFE
COUNTIES.

The elevations in the following list depend on a bench mark established by precise levels of the Coast and Geodetic Survey at Lexington and described as follows: Lexington, at northeast corner of South Broadway and Maxwell streets, at east stairway entrance to Dr. H. A. Phillips's drug store, in door stone, 5 inches east of west end and 4 inches above sidewalk; brass bolt stamped "U. S. C. & G. S.," the elevation of which is accepted as 979.552 feet above mean sea level.

The leveling was done in 1906 by W. H. Monahan.

From Lexington east along Lexington & Eastern Ry.

	Feet
Lexington, in front of station; top of rail.....	946.9
Lexington, on stone wall around station platform; chiseled square	947.378
Lexington, 3.92 miles southeast of, in abutment of bridge; aluminum tablet stamped "904"	963.715
Montrose, 50 feet south of railroad station; iron post stamped "939"	938.793
Fenwick, in front of station; top of rail	938.3
Fenwick, 0.45 mile southeast of, in bridge abutment; aluminum tablet stamped "919"	918.793
Avon, in front of station; top of rail.....	943.6
Avon, 0.91 mile southeast of, in bridge abutment; aluminum tablet stamped "954"	953.635
Avon, 3.03 mile southeast of, abutment of overhead bridge; aluminum tablet stamped "987"	987.084
Wyandotte, in front of station; top of rail	989.6
Wyandotte, 4.07 miles southeast of, in railroad girder bridge; aluminum tablet stamped "919"	919.450
Wyandotte, 6.07 miles southeast of, in abutment of railroad bridge; aluminum tablet stamped "965"	964.882
Winchester, in front of station; top of rail.....	980.8
Winchester, 3.81 miles southeast of, in abutment of railroad bridge, aluminum tablet stamped "933"	932.509
Winchester, 5.87 miles southeast of, in abutment of railroad bridge; chiseled square	922.751

	Feet
Lexington & Eastern Ry. junction, 0.20 mile southeast of, in abutment of railroad bridge; aluminum tablet stamped "940"	939 684
Lexington & Eastern Ry. junction, 4.02 miles southeast of, on stone in cut south of track; chiseled square.....	869.39
Lexington & Eastern Ry. junction, 4.03 miles southeast of, on south side of cut, 5 feet south of track, 2 feet from ground, in stone; aluminum tablet stamped "870"	869 989
Indian Field, northwest corner of A. B. Hampton farm, 35 feet south of track, 10 feet from road; iron post stamped "746"	745.918
Indian Field, in front of station; top of rail	745 6
Argyle, at southwest corner of J. A. Robert's store, aluminum tablet stamped "720"	719.998
Argyle, in front of station; top of rail	721.6
Virden, in front of station; top of rail	659.7
Shawnee, in front of station; top of rail	627.9
Shawnee, 0.04 mile southeast of, in southwest corner of abutment of Red River bridge; aluminum tablet stamped "627"	627.164
Clay City, in front of station; top of rail	627.8
Clay City, 2.06 miles southeast of, in stone abutment at southwest corner of bridge; aluminum tablet stamped "641"	641.044
Stanton, in front of station; top of rail	662.1
Stanton, 1.78 miles southeast of, in stone abutment at southwest corner of bridge; aluminum tablet stamped "647"	647.611
Rosslyn, in front of station; top of rail.....	667.6
Filson, in front of station; top of rail.....	666 9
Filson, 0.22 mile southeast of, in southwest corner of stone culvert, under track; aluminum tablet stamped "663"	662.609
Lombard, 0.32 mile southeast of, in southwest corner of abutment of bridge; aluminum tablet stamped "680"	680.052
Dundee, in front of station; top of rail.....	710.5
Dundee, 0.76 mile southeast of, in northwest corner of abutment of bridge; aluminum tablet stamped "726"	725.827
Natural bridge, in front of station; top of rail	762 8
Natural Bridge, 0.68 mile southeast of, in northwest corner of abutment of bridge; aluminum tablet stamped "774"	774 171
Glencairn, in front of station; top of rail.....	783 7
Glencairn, 2.63 miles southeast of, on southwest corner of bridge abutment; chiseled square ..	884 93
Torrent, 60 feet northwest of station, 60 feet north of track; iron post stamped "938"	938.310
Torrent, in front of station; top of rail.....	939.2
Torrent, 1.92 miles southeast of, south side of cut, on stone; chiseled square	865.14
Torrent, 4.92 miles southeast of, in east end of stone culvert south of track; aluminum tablet stamped "707" ..	760.992
Fincastle, in front of station; top of rail ..	711.1

Fincastle, 2.0 miles southeast of, on southeast corner of stone abutment of bridge; chiseled square.....	Feet 683.84
Beattyville Junction, in front of station; top of rail.....	689.8
Beattyville Junction, 0.1 mile southeast of, east end of bridge, at southeast corner, stone abutment; aluminum tablet stamped "684"	684.232
St. Helens, in front of station; top of rail.....	674.0
St. Helens, 0.23 mile southeast of, stone foundation of watering tank, at center of north side, northwest corner, in first stone from ground; aluminum tablet stamped "674"	673.764
Monica, in front of station; top of rail.....	683.43
Monica, 0.31 mile southeast of, 30 feet south of track, 100 feet east of road crossing; iron post stamped "675".....	674.888
Tallega, 2.67 miles southeast of, in southeast corner of stone abutment of bridge; aluminum tablet stamped "745".....	745.081
Athol, in front of station; top of rail.....	744.2
Athol, 2.92 miles southeast of, in southwest corner of stone abutment of small bridge; aluminum tablet stamped "773" ..	773.404
Oakdale, in front of station; top of rail.....	791.2
Oakdale, 3.36 miles southeast of, in southwest corner of stone culvert; aluminum tablet stamped "864"	863.824
Oakdale, 4.46 miles southeast of, on stone north of track, in cut; chiseled square	814.85
Oakdale, 5.48 miles southeast of, in southwest corner of stone culvert; aluminum tablet stamped "747".....	746.769
Elkatawa, in front of station; top of rail.....	745.7
Ohio & Kentucky Ry. junction, in front of station; top of rail	737.4
Ohio & Kentucky Ry. junction, 0.21 mile southeast of, on north end of iron pipe under track; chiseled square.....	741.27
Ohio & Kentucky Ry. junction, 1.21 miles southeast of, in lot of Jackson Coal Co. superintendent's residence; iron post stamped "750"	750.454
Jackson, in top of west end of stone wall at south side of courthouse yard; aluminum tablet stamped "791".....	791.075
Jackson courthouse, in northwest corner of grounds; iron post stamped "790"	790.196

FRANKLIN, JEFFERSON, SCOTT, AND SHELBY COUNTIES.

A line of precise levels was run in the spring of 1906 from bench mark W at Georgetown, Ky., established by the Coast and Geodetic Survey from precise levels, west over the Louisville & Nashville R. R. to Louisville, where bench mark 10 of the United States Corps of Engineers was tied to. The initial value at Georgetown was accepted as 877.049 feet above mean sea level, and the corrected value of bench mark 10, United States Corps of

Engineers, was accepted as 417.143 feet, in agreement with the 1912 adjustment. The total divergence of the line was minus 0.078 foot and the total distance 78.7 miles.

A second bench mark of the Corps of Engineers at 27th Street bridge, Louisville, the corrected elevation of which is 430.364 feet above mean sea level, was tied to by a line run from a bench mark at 11th and Main streets, Louisville, on the first line, a distance of 2.7 miles. The closure error between the 11th and 27th street bench marks was 0.010 foot low. The divergence was plus 0.010 foot.

The leveling was done in 1906 by C. H. Semper.

From Georgetown west via Frankfort and Cincinnati R. R. to Duvall.

Georgetown, 75 feet southwest of Cincinnati, New Orleans & Texas Pacific Ry. station, northeast corner of foundation of E. N. Offutt & Sons' warehouse, west side of Maddox Street, 110 feet north of Jackson Street, in north face, 6 inches west of corner, 0.83 meter above ground; chisel mark in copper bolt, lettered "U. S. C. & G. S." (Coast and Geodetic Survey, b. m. W) ..	Feet 877.019
Georgetown, at southeast corner of Sinclair's store, in Mrs. T. B. Sinclair's lot; iron post stamped "Prim. Trav. Sta. No. 17, 866"	865.542
Georgetown, 3 miles west of, in top of east end of culvert abutment, north of track; aluminum tablet stamped "798" ..	797.710
Johnson, in front of station; top of rail	864.6
Duvall Station, in top of west wall of culvert east of road, 5 feet north of track; aluminum tablet stamped "840"	840.391
Duvall, in front of station; top of rail	839.3

From Duvall west via Frankfort & Cincinnati R. R. to Switzer.

Stamping Ground, in Dr. Reilly's front yard, south of track, 230 feet west of station; iron post stamped "Prim. Trav. Sta. No. 26, 802" ..	802.343
Stamping Ground, in front of station; top of rail	799.2
Stamping Ground, 12.1 miles west of, top of west abutment of bridge south of track; aluminum tablet stamped "714" ..	713.582
Switzer, 40 feet west of station, 9 feet south of track, in top of culvert; aluminum tablet stamped "732" ..	732.552
Switzer, in front of station; top of rail	735.1

From Switzer west via Louisville & Nashville R. R. to
Hatton.

	Feet
Elkhorn, in front of station; top of rail	662 0
Elkhorn, 75 feet west of station, at northeast corner of ware- house; iron post stamped "673"	673.223
Stedman, in front of station; top of rail	711 2
Stedman, 360 feet west of station, top of east end of culvert 6 feet north of track; aluminum tablet stamped "714"	714.410
Frankfort, southwest corner of old capitol grounds; iron post stamped "511 Lexington"	511.208
Frankfort, in northeast corner of front face of post-office building; aluminum tablet stamped "512"	512.331
Kennebec, in front of station; top of rail	507.5
Kennebec, 1.3 miles west of, top of retaining wall of steel bridge, north of track; aluminum tablet stamped "537"	536 959
Benson, in front of station; top of rail	597.5
Benson, 0.3 mile west of, top of retaining wall, in east abut- ment of steel bridge, north of track; aluminum tablet stamped "600"	599.745
Hatton, in front yard of C. W. Stockton's tenement house opposite Roberts and Wright's general store, north of track, 10 feet north of fence; iron post stamped "714"	714 474
Hatton, in front of station; top of rail	706 1
Hatton, 2.8 miles west of, east end of culvert north of track; aluminum tablet stamped "829"	829.599

From point 2.2 miles west of Christiansburg west along
Chesapeake and Ohio Railroad to Shelbyville.

Christiansburg 6.4 miles west of, in top of west end of cul- vert south of track; aluminum tablet stamped "724"	723 963
Shelbyville, in courthouse yard, 10 feet east of southeast cor- ner of courthouse; iron post stamped "Prim. Trav. Sta. No. 2, 760"	759.710

NOTE.—Post at Shelbyville moved 102 feet S. 24° 15' W.
from former location. Present elevation (1913)..... 760.090
Shelbyville, in front of station; top of rail... 729 7

From Bagdad west along Louisville & Nashville R. R. to
point near Christiansburg.

Bagdad, in front of station; top of rail	912.1
Bagdad, 40 feet west of station, 45 feet south of track; iron post stamped "912"	911.936
Christiansburg, 135 feet east of station, in northeast corner of Mrs. Miriam Hall's front yard; iron post stamped "903"	903.401
Christiansburg, in front of station; top of rail	906.0

Christiansburg, 2.2 miles west of, east of road and 43 feet south of track at Mulberry Crossing; iron post stamped "849"	Feet 849 412
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From Shelbyville west along Chesapeake & Ohio R. R. to
Beckley.

Harblson, in front of station; top of rail	792.8
Scott, opposite station, 45 feet north of track, west of road, at fence line; iron post stamped "756"	750 14 1
Scott, in front of station; top of rail	744.4
Field, in front of station; top of rail	734.9
Field, 0.2 mile west of station, top of west abutment of tres- tle; aluminum tablet stamped "725"	724.330
Field, 1 mile west of, south of track, in top of east wall of culvert; chiseled square	750.05
Simpsonville, in front of station; top of rail	796.0
Simpsonville, in southeast corner of Masonic Lodge grounds; iron post stamped "Prim. Trav. Sta. No. 1, 825, 1905"	824.786
Connor, in front of station; top of rail	705.7
Connor, 50 feet south of station, east of road in angle with right of way; iron post stamped "701"	701.433
Long Run, 100 feet east of station, north of track at inter- section of road with right of way; iron post stamped "629"	629 399
Long Run, in front of station; top of rail	629.0
Eastwood, in front of station; top of rail	651.6
Beckley, 0.1 mile east of, top of retaining wall west abut- ment of bridge south of track; aluminum tablet stamped "595"	595.221
Beckley, in front of station; top of rail	599.0

From Beckley west along Louisville & Nashville R. R. to
Louisville.

Avoca, in front of station; top of rail	664.5
Anchorage, in circular park, 300 feet northwest of clubhouse; iron post stamped "Prim. Trav. Sta. No. 38, 724"	724.264
Anchorage, in front of station; top of rail	716.5
Lakeland, in front of station; top of rail	693 0
Lyndon, in front of station; top of rail	566 5
Lyndon, 260 feet west of station, 40 feet east of road south of track; iron post stamped "561"	561 486
Warwick Villa, 0.3 mile west of south of track, on west wall of culvert; marked square	538.98
St. Matthews, in front of station; top of rail	552.5
St. Matthews, 441 feet west of, 25 feet east of forks to south; iron post stamped "Prim. Trav. Sta. No. 118, 550"	549.982

St. Matthews, 0.7 mile west of, southwest corner of Finley and Shelby pikes; iron post stamped "Prim. Trav. Sta. No. 117, 548".....	Feet 547.862
St. Matthews, 1.4 miles west of, south side of Frankfort Avenue, north of wall to waterworks, water tank nearest corner, azimuth 57° 18', distance 42.5 feet, corner of stone wall at waterworks, azimuth 348° 28', distance 7 feet; iron post stamped "553"	553.669
Louisville, southeast corner of Park Avenue and Shelbyville Road; iron post stamped "Prim. Trav. Sta. No. 49, 538".	537.919

JEFFERSON COUNTY.

The bench marks in the following list were established in the spring of 1906 by C. H. Semper, detailed by the United States Geological Survey to the commissioners of sewerage of the city of Louisville. Elevations depend upon the heights of two bench marks of the United States Army Engineers by the 1912 adjustment of precise leveling, bench mark No. 10, elevation 417.143 feet, and a bench mark at west side of approach to 27th Street bridge, elevation 430.364 feet.

The area of the city was divided into 12 rectangular blocks approximately 1.5 by 2 miles, around the borders of which lines of primary traverse and precise levels were run. At intervals of 2,000 feet along the route a permanent bench mark was placed, consisting of a bronze tablet 3.5 inches in diameter, countersunk and cemented into the top of a stone post 3 feet in length, dressed 6 inches on top, set in ground flush with surface.

Each standard bench mark is stamped "Louisville City Survey, Elevation Above Sea—, B. M. and Prim. Trav. Sta. No.—," with its proper number and figures of elevation to the nearest foot. The bench marks on line from Georgetown to 27th Street set by Semper are iron posts.

Louisville City Survey.

B. M. 1, on south side of Bell's lane, 180 feet west of driveway to R. L. Newell's farmhouse, 3 feet north of east-west fence; nail in blaze of tree, azimuth 174°, distance 173.8 feet; gatepost, azimuth 3° 03', distance 62.1 feet; bronze tablet stamped "454".....	451.453
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B. M. 2, in top of bank on south side of road in Bell's lane, 1,100 feet west of Cane Run road; Louis Plochner's house, azimuth 242° 27', distance 144.1 feet; tree, azimuth 212° 16', distance 46.6 feet; bronze tablet stamped "455".....	Feet 455.670
B. M. 3, on east side of Cane Run road, 820 feet northeast of Bell's lane, 9 feet west of fence, 41.7 feet southwest to nail in telephone pole, 37.4 feet south to cross on north end of stone culvert; nail in telephone pole, azimuth 112° 18', distance 41.7 feet; bronze tablet stamped "456".....	456.121
B. M. 4, at intersection of Cane Run road and Beech Street; pump azimuth 113° 32', distance 19.5 feet; Cramer's saloon, azimuth 177° 49', distance 26.5 feet; bronze tablet stamped "458".....	457.910
B. M. 5, at northwest corner of Beech Street and Woodward Avenue; gas pipe on corner, azimuth 280° 07', distance 50.6 feet; house, azimuth 117° 32', distance 39 feet; bronze tablet stamped "453".....	453.518
B. M. 6, at southwest corner of Dumesnil (?) and Amber streets, at foot of Twenty-eighth Street; drug store, azimuth 139° 00', distance 80.2 feet; corner of store, azimuth 205° 26', distance 43.3 feet; bronze tablet stamped "453".....	453.497
B. M. 7, at northeast corner of Twenty-eighth and Kentucky streets; northwest corner of grocery store, azimuth 1° 53', distance 62.1 feet; corner of bakery, azimuth 212° 12', distance 200 feet; bronze tablet stamped "446".....	446.540
B. M. 8, at southeast corner of Twenty-eighth Street and Broadway; corner of post-office station H, azimuth 192° 13', distance 85.6 feet; northwest corner of curb, azimuth 144° 04', distance 61.8 feet; bronze tablet stamped "448".....	448.334
B. M. 9, at southeast corner of Twenty-eighth and Madison streets; grocery store, azimuth 310° 29', distance 7 feet; corner of residence No. 1600, azimuth 91° 36', distance 60.9 feet; bronze tablet stamped "449".....	449.076
B. M. 10, on north side of Market Street at head of Twenty-eighth Street; grocery store, azimuth 355° 22', distance 66.9 feet; corner of saloon, azimuth 52° 04', distance 79.1 feet; bronze tablet stamped "451".....	451.312
B. M. 11, at northeast corner of Twenty-sixth and Rowan streets; corner of saloon, azimuth 227° 00', distance 9.1 feet; south end of fence, azimuth 135° 22', distance 61.9 feet; bronze tablet stamped "452".....	451.780
B. M. 12, at northeast corner of Twenty-sixth and Slevin streets; corner of Ohlman's Exchange, azimuth 100° 28', distance 47 feet; Hochstrass, azimuth 258° 28', distance 9.8 feet; bronze tablet stamped "459".....	458.896

	Feet
B. M. 13, at southeast corner of Twenty-sixth and Portland streets; grocery store, azimuth 108° 09', distance 46.6 feet; Struby's pump, azimuth 352° 46', distance 7.9 feet; bronze tablet stamped "454" .	454.028
B. M. 14, on Portland avenue, 65 feet west of west curb to Thirtieth street and 8 feet east of center of Kentucky & Indiana Terminal R. R.; bronze tablet stamped "457" .	456.999
B. M. 15, northwest corner of Thirty-third and Rudd streets; grocery store, azimuth 136° 45', distance 9.3 feet; pump, azimuth 260° 08', distance 81.5 feet; bronze tablet stamped "443" .	443.390
B. M. 16, at southeast corner of Thirty-fifth and Water streets; corner of saloon, azimuth 317° 50', distance 15.5 feet; manhole in Water street, azimuth 199° 03', distance 10.7 feet; bronze tablet stamped "431" .	431.530
B. M. 17, southwest corner of Thirty-fifth and High streets; south corner of wall of academy grounds, azimuth 130° 15', distance 129 feet; cement foundation, azimuth 55° 48', distance 13.7 feet; bronze tablet stamped "452" .	452.495
B. M. 18, on south side of High Street, 446 feet west of west curb to Thirty-eighth street; corner of brick house, azimuth 191° 33', distance 91.9 feet; corner of warehouse, azimuth 132° 03', distance 131 feet; bronze tablet stamped "455" .	455.053
B. M. 19, on south side of High street extended and on north side of Mrs. Annie Findlay's farm, 300 feet from Ohio river; nail in sycamore tree, azimuth 267° 40', distance 59.5 feet; nail in tree, azimuth 132° 27', distance 73.4 feet; bronze tablet stamped "436" .	436.691
B. M. 20, at southwest corner of Fountain Ferry road and boulevard, at northwest corner of Fountain Ferry Park; nail in pole, azimuth 295° 26'; nail in tree, azimuth 258° 56'; bronze tablet stamped "457" .	457.605
B. M. 21, at junction of east-west road and road north in west part of Shawnee Park; water plug, azimuth 47° 35', distance 46 feet; lamp-post, azimuth 324° 28', distance 4.5 feet; bronze tablet stamped "454" .	454.472
B. M. 22, on West Broadway, 100 feet west of car loop at Shawnee Park; nail in tree, azimuth 120° 09', distance 72.8 feet; urn, azimuth 303° 55', distance 174 feet; bronze tablet stamped "450" .	450.411
B. M. 23, on Broadway, at head of Forty-second street; telephone pole, azimuth 314° 44', distance 71 feet; telephone pole, azimuth 48° 28', distance 76 feet; bronze tablet stamped "448" .	448.386

	Feet
B. M. 24, on northeast corner of Broadway and Thirty-seventh street; corner of red brick house, azimuth 220° 49', distance 47.9 feet; southeast corner of yellow brick house, azimuth 104° 31', distance 188.5 feet; bronze tablet stamped "448" .	448.702
B. M. 25, on north side of Broadway at Thirty-second street; south corner of church, azimuth 317° 47', distance 164.9 feet; post, azimuth 19° 45', distance 81.5 feet; bronze tablet stamped "450" .	450.445
B. M. 26, on south side of Greenwood avenue and just east of Spring Bank electric railway station; nail in cherry tree, azimuth 87° 07', distance 18.3 feet; nail in gum tree, azimuth 205° 46', distance 64.5 feet; bronze tablet stamped "454" .	454.500
B. M. 27, on Dr. B. A. Garr's farm, in northeast corner of barn lot; corner of house, azimuth 203° 28', distance 77.4 feet; bronze tablet stamped "455" .	455.570
B. M. 28, on south side of Gibson's lane, just east of Little Paddy's Run; nail in sycamore tree, azimuth 146° 24', distance 75.5 feet; nail in cherry tree, azimuth 200° 13', distance 81.7 feet; bronze tablet stamped "450" .	450.827
B. M. 29, on south bank of Little Paddy's Run, about 400 feet southwest of house rented by Frank Meyers; bronze tablet stamped "455" .	455.345
B. M. 30, in Belt's lane and about 300 feet east of bank of Ohio River, 4 feet north of fence; nail in walnut tree, azimuth 272° 12', distance 203.1 feet; tree, azimuth 75° 52', distance 46.2 feet; bronze tablet stamped "451" .	451.350
B. M. 31, north side of Bell's lane, just east of entrance to Christ Gilchrist's farm; corner of his house, azimuth 168° 13'; distance 101.2 feet; nail in gum tree, azimuth 62° 27', distance 82.1 feet; bronze tablet stamped "446" .	446.374
B. M. 32, on east side of Cane Run Road, just north of Woodlawn avenue; nail in tree, azimuth 81° 59', distance 107.6 feet; southeast corner of house, azimuth 121° 38', distance 52.7 feet; bronze tablet stamped "459" .	459.471
B. M. 33, on east side of Eighteenth street at Ormsby avenue; water plug, azimuth 27° 53', distance 21.8 feet; southeast corner of saloon, azimuth 125° 52', distance 57.5 feet; bronze tablet stamped "451" .	451.100
B. M. 34, on southeast corner of Sixteenth street and Ormsby avenue; center of manhole, azimuth 206° 02', distance 5.2 feet; southeast corner of house No. 1545, azimuth 147° 43', distance 99.5 feet; bronze tablet stamped "452" .	451.966
B. M. 35, on southeast corner of Twelfth street and Ormsby avenue; northeast corner of house, azimuth 83° 52', distance 56.3 feet; southwest corner of box factory, azimuth 190° 52', distance 67.6 feet; bronze tablet stamped "452" .	452.316

	Feet
B. M. 36, on southeast corner of Seventh street and Ormsby avenue; water plug, azimuth 249° 59', distance 22.9 feet; northeast corner of Kentucky Heating Co.'s porch, azimuth 48° 51', distance 62.5 feet; bronze tablet stamped "460"....	460.469
B. M. 37, on southwest corner of Third street and Ormsby avenue; corner fence post, azimuth 169° 54', distance 69.9 feet; gate post at No. 1400, azimuth 46° 08', distance 38.2 feet; bronze tablet stamped "456".....	456.416
B. M. 38, northeast corner of Ormsby avenue and Preston street; southeast corner of McGee's drug store, azimuth 155° 23', distance 101.9 feet; northwest corner of store building on southeast corner of Ormsby avenue and Preston street, azimuth 2° 29', distance 54.6 feet; bronze tablet stamped "453"	453.244
B. M. 39, northwest corner of Ormsby avenue and Shelby street; southwest corner of Kentucky Refining Co.'s office, azimuth 211° 15'; northeast corner of car barn, azimuth 12° 05', distance 56.5 feet; bronze tablet stamped "460"....	460.564
B. M. 40, west side of Shelby street, opposite St. Catherine street, East; southwest corner of residence No. 1741, azimuth 248° 28', distance 77.9 feet; center of pump, azimuth 324° 42', distance 64 feet; bronze tablet stamped "459".....	459.286
B. M. 41, northwest corner of Breckinridge and Shelby streets; southwest corner of drug store, azimuth 272° 10', distance 54.4 feet; southeast corner of grocery store and saloon, azimuth 137° 16', distance 7.4 feet; bronze tablet stamped "453"	452.823
B. M. 42, northwest corner of Broadway and Shelby street; southeast corner of saloon, azimuth 168° 46', distance 15.8 feet; southwest corner of Neider Bros. grocery store, azimuth 259° 46', distance 42.5 feet; bronze tablet stamped "449"	449.268
B. M. 43, northwest corner of Shelby and Green streets; southeast corner of Scott's hardware store, azimuth 135° 47', distance 6.9 feet; southwest corner of Herman's saloon, azimuth 273° 37', distance 53.3 feet; bronze tablet stamped "460" ..	460.173
B. M. 44, northwest corner of Main and Shelby streets; southwest corner of Methodist Church corner stone, azimuth 261° 32', distance 60.3 feet; southeast corner of roofing store, azimuth 140° 07', distance 6.4 feet; bronze tablet stamped "464"	464.605
B. M. 45, north corner of Story avenue and Louisville & Nashville R. R. crossing; north corner of post office station A, azimuth 7° 29', distance 75 feet; south corner of National Leather Co.'s building, azimuth 189° 57', distance 7.8 feet; bronze tablet stamped "458"	458.447

	Feet
B. M. 46, north side of Story avenue and Frankfort avenue, Southeast; northwest corner of grocery store, azimuth 300° 17', distance 62.9 feet; corner of saloon, azimuth 226° 48', distance 12.9 feet; bronze tablet stamped "457"....	456.842
B. M. 47, west corner of Frankfort avenue and Haldeman street, North; northeast corner of store, azimuth 53° 18', distance 86.6 feet; corner post to B. I. grounds, azimuth 137° 08', distance 10.7 feet; bronze tablet stamped "510" ..	510.301
B. M. 48, southwest corner of Frankfort avenue and Keats street, south; water plug, azimuth 105° 20', distance 5.9 feet; northwest corner of house, azimuth 272° 15', distance 30.2 feet; bronze tablet stamped "524"....	523.822
B. M. 49, southeast corner of Frankfort avenue and Park avenue south; corner of Crescent Hill pharmacy, azimuth 74° 24', distance 55.8 feet; corner of Crescent Drug Co., azimuth 327° 07', distance 8.6 feet; bronze tablet stamped "538"	537.919
B. M. 50, south side of Frankfort avenue, north of wall to waterworks; water tank nearest corner, azimuth 57° 18', distance 42.5 feet; corner of stone wall at waterworks, azimuth 348° 28', distance 7 feet; bronze tablet stamped "553"	553.670
B. M. 51, northwest corner of crossing of Brownsboro road and Pipe Line avenue; north corner of westernmost gatepost to entrance to reservoir grounds, azimuth 332° 02', distance 68.8 feet; center of water plug, azimuth, 229° 09', distance 48.2 feet; bronze tablet stamped "554" ..	554.044
B. M. 52, west side of Pipe Line avenue, or cinder road, 3,750 feet south of Prospect Electric R. R. and 950 feet north of T road east; nail in locust tree, azimuth 18° 27', distance 21.8 feet; nail in locust tree, azimuth 126° 06', distance 26.7 feet; bronze tablet stamped "521"....	521.520
B. M. 53, west side of Pipe Line avenue or cinder road just north of Prospect Electric R. R.; tree, azimuth 217° 45', distance 28.7 feet; tree, azimuth 86° 22', distance 22.1 feet; bronze tablet stamped "441" ..	441.198
B. M. 54, south side of River road about 600 feet west of entrance to golf links; nail in tree, azimuth 78° 32', distance 92.6 feet; nail in hollow tree, azimuth 154° 12', distance 40 feet; bronze tablet stamped "432"....	432.614
B. M. 55, south side of River road opposite G. Hooper's residence; iron pump, azimuth 125° 20', distance 55 feet; north corner of brick house, azimuth 356° 59', distance 58.6 feet; bronze tablet stamped "434".....	434.698

B. M. 56, east side of River road, 678 feet northeast of Louisville & Nashville R. R., nail in telephone pole, azimuth 94° 55', distance 69.4 feet; north corner of house, azimuth 15° 50', distance 64.1 feet; bronze tablet stamped "439" (in front of W. Vest's house).	Feet 439.335
B. M. 57, north corner of Van Buren and Marion streets; east corner of house, azimuth 82° 54', distance 60.3 feet; center of pump, azimuth 23° 33', distance 58.8 feet; bronze tablet stamped "437".	437.668
B. M. 58, north corner of Fulton and Adams streets; corner of saloon and grocery, azimuth 337° 11', distance 11.9 feet; northwest corner of sawmill office, azimuth 205° 08', distance 68.8; bronze tablet stamped "441".	441.494
B. M. 59, northeast corner of Fulton and Shelton streets; center of fire plug, distance 61.1 feet; center of westernmost boiler, distance 42.5 feet; bronze tablet stamped "440".	439.851
B. M. 60 southwest corner of Seventh and Shipp streets; center of pump, azimuth 121° 33', distance 6.4 feet; northwest corner of saloon, azimuth 336° 20', distance 5.5 feet; bronze tablet stamped "457".	457.678
B. M. 61, west side of Seventh street road, about 720 feet south of Southern Ry.; nail in small tree, azimuth 64° 42', distance 48.9 feet; nail in telephone pole, azimuth 353° 24', distance 54.1 feet; bronze tablet stamped "465".	465.350
B. M. 62, on west side of Seventh street road, 680 feet south of Thompson's road; northeast corner of Jacob Schafflin's residence, azimuth 57° 17', distance 97.1 feet; nail in telephone pole, azimuth 259° 14', distance 67.6 feet; bronze tablet stamped "458".	458.782
B. M. 63, west side of Seventh street road, at Arcade avenue southeast; northeast corner of brick dwelling (Jacob Hepp's house), azimuth 132° 01', distance 65.9 feet; southwest corner of G. J. Schmidt's saloon and grocery, azimuth 316° 33', distance 63 feet; bronze tablet stamped "455".	455.295
B. M. 64, on west side of Sand River road opposite entrance to Bohemian farm; nail in telephone pole, azimuth 171° 34', distance 30.4 feet; nail in large beech tree, azimuth 266° 33', distance 79.1 feet; bronze tablet stamped "461".	461.554
B. M. 65, on east side of Eighteenth street or Sand River road, at schoolhouse lane west; center of stone post at corner of schoolhouse lane, azimuth 108° 31', distance 47.2 feet; southwest corner of schoolhouse, azimuth 254° 04', distance 80.7 feet; bronze tablet stamped "463".	463.128

B. M. 66, on south side of schoolhouse lane just west of entrance to W. T. Hartledge's farm; nail in west gatepost of W. Hartledge road, azimuth 276° 46', distance 54.4 feet; nail in pear tree, azimuth 33° 25', distance 5.3 feet; bronze tablet stamped "464".	Feet 464.051
B. M. 67, on west side of road, 0.33 mile south of intersection of Cane Run road and Bell's lane; nail in gatepost south side of schoolhouse lane, azimuth 324° 36', distance 22 feet; bronze tablet stamped "451".	451.109
B. M. 68, on east side of Taylor Boulevard at Arcade avenue northwest; south corner of house, azimuth 164° 16', distance 119.6 feet; bronze tablet stamped "455".	455.110
B. M. 69, on Taylor Boulevard at junction with Berry Boulevard; southeast corner of saloon, azimuth 123° 10', distance 98 feet; northeast corner blacksmith shop, azimuth 64° 50', distance 108.4 feet; bronze tablet stamped "456".	456.195
B. M. 70, on east side of Taylor boulevard, at Woodland Grove; southeast corner of grocery store, azimuth 107° 41', distance 79.2 feet; nail in elm tree, azimuth 265° 19', distance 79.6 feet; bronze tablet stamped "454".	454.613
B. M. 71, on east side of Taylor boulevard, north of Hazlewood road; nail in locust tree, azimuth 130° 57', distance 63.8 feet; nail in small sycamore tree, azimuth 57° 04', distance 43 feet; bronze tablet stamped "474".	473.854
B. M. 72, on west side of Taylor boulevard, at Joseph App's house; northeast corner of house, azimuth 61° 16', distance 94.8 feet; nail in telephone pole, azimuth 351° 54', distance 10.6 feet; bronze tablet stamped "481".	481.040
B. M. 73, on south side of Taylor boulevard at Third street boulevard northeast; south corner of Boone cabin, azimuth 203° 25'; south corner of arch, azimuth 316° 35', distance 139.5 feet; bronze tablet stamped "463".	493.211
B. M. 74, on west side of parking to Third street, about 2,400 feet northeast of end of boulevard; center of lamp post, azimuth 39° 06', distance 56.8 feet; nail in box elder tree, azimuth 118° 31', distance 55.2 feet; bronze tablet stamped "472".	471.946
B. M. 75, on west side of parking to Third street, 812 feet south of street car line, between Blue Grass and Woodlawn avenues; nail in blaze on tree, azimuth 188° 11', distance 69 feet; center of lamp post, azimuth 295° 03', distance 54.7 feet; bronze tablet stamped "465".	464.934
B. M. 76, on west side of parking at milepost 1¼, between Ashland and Park avenues; northeast corner of porch to residence opposite milepost, azimuth 112° 18', distance 123.8 feet; center of lamp post, azimuth 192° 58', distance 102.4 feet; bronze tablet stamped "476".	476.158

	Feet
B. M. 77, on west side of Third street boulevard, at mile-post 2; blaze on sycamore tree, azimuth 102° 02', distance 42.7 feet; center of lamp post, azimuth 289° 54', distance 54.7 feet; bronze tablet stamped "458" (between Lansing and Whitney streets)...	458.491
B. M. 78, on west side of boulevard, 130 feet north of Kenton avenue; southeast corner of mottled brick residence, azimuth 147° 41', distance 108.9 feet; center of lamp post, azimuth 240° 09', distance 61 feet; bronze tablet stamped "456"	456.618
B. M. 79, on west side of Third street, 229 feet south of south curb of P street; nail in poplar tree, azimuth 198° 49', distance 11.8 feet; Christian Mission, southwest corner of, azimuth 208° 07', distance 103.4 feet; bronze tablet stamped "457"	457.780
B. M. 80, on southwest corner of Third avenue and L street west; southeast corner of Gass drug store, azimuth 164° 47', distance 114.1 feet; center of water plug, azimuth 286° 59', distance 58 feet; bronze tablet stamped "458"	458.457
B. M. 81, on north end of Triangle park; southwest corner of Confederate Monument, azimuth 195° 30', distance 127.8 feet; Louisville Reform School, center of tablet, azimuth 243° 19', distance 89 feet; bronze tablet stamped "458".....	458.175
B. M. 82, on northwest corner of Third and Hill streets; northeast corner of residence No. 1700, azimuth 59° 49', distance 80.5 feet; northwest corner of residence No. 1801, azimuth 303° 33', distance 113.2 feet; bronze tablet stamped "455"	455.123
B. M. 83, on southwest corner of Main and Jackson streets; northeast corner of retaining wall to yard, azimuth 43° 40', distance 13.7 feet; northwest corner of American machine shops, azimuth 290° 14', distance 52.4 feet; bronze tablet stamped "458"	458.543
B. M. 84, on southeast corner of Main and First streets; northeast corner of Bill Dryer Co.'s building, azimuth 93° 34', distance 53.3 feet; northwest corner James Thompson & Bros. liquor store, azimuth 299° 30', distance 10.2 feet; bronze tablet stamped "461"	461.527
B. M. 85, on northwest corner of Main and Seventh streets; northwest corner of post-office station 23, azimuth 340° 03', distance 105 feet; southwest corner of drug store, azimuth 282°, distance 49.2 feet; bronze tablet stamped "458".....	458.359
B. M. 86, on northeast corner of Main and Eleventh streets; southeast corner of Doyle's saloon, azimuth 99° 04', distance 50.1 feet; northeast corner of J. V. Reed & Co.'s store, azimuth 37° 30', distance 101.6 feet; bronze tablet stamped "454"	454.333

	Feet
B. M. 87, on northeast corner of Main and Fifteenth streets; southeast corner R. F. Avery & Sons' store, azimuth 109° 11', distance 52.8 feet; northwest corner of J. B. Gibson's store, azimuth 1° 56', distance 80.2 feet; bronze tablet stamped "458"	457.825
B. M. 88, on northeast corner of Main and Nineteenth streets; pump at southwest corner, azimuth 37° 56', distance 87.3 feet; saloon at northwest corner, azimuth 100° 53', distance 50.5 feet; bronze tablet stamped "454"	454.602
B. M. 89, on northeast corner of Main and Twenty-fourth streets; dry goods store, southeast corner, azimuth 108° 56', distance 53.6 feet; northwest corner of American Tobacco Co.'s warehouse, azimuth 2° 45', distance 80.2 feet; bronze tablet stamped "455"	455.090
B. M. 90, on southeast corner of Preston and Burnett streets; crossing gate Louisville & Nashville R. R., azimuth 91° 31', distance 42.2 feet; switch block to railroad, azimuth 218° 22', distance 35.3 feet; bronze tablet stamped "453".....	453.332
B. M. 91, on south corner of Preston and Vandise streets. United Brethren Church, north corner, azimuth 50° 01', distance 142.6 feet; R. Nussbaum's saloon, southeast corner, azimuth 135° 29', distance 52.9 feet; bronze tablet stamped "479"	479.450
B. M. 92, on southwest corner of Jackson and F streets; southwest corner of Williams' store, azimuth 220° 04', distance 105.4 feet; northeast corner residence 536 F street, azimuth 86° 31', distance 50 feet; bronze tablet stamped "492"	492.191
B. M. 93, on east side of Ash Bottom road, 515 feet north of Southern Ry.; nail in fence post, elevation 483 feet, azimuth 113° 17', distance 38.7 feet; nail in blaze on west face of locust tree, azimuth 184° 28', distance 121.9 feet; bronze tablet stamped "483".....	483.272
B. M. 94, on east side of Ash Bottom road, just south of entrance to Henry Happhage's farm; nail in blaze on locust tree, azimuth 79° 19', distance 46 feet; cross on top of corner stone, azimuth 215° 20', distance 29.6 feet; bronze tablet stamped "484".....	484.695
B. M. 95, on east side of Ash Bottom road, just south of bridge; nail in blaze on small tree, azimuth 81° 05', distance 26.9 feet; southeast corner foundation to bridge, azimuth 205° 46', distance 22 feet; bronze tablet stamped "467"	467.553
B. M. 96, on west side of Ash Bottom road; corner of small frame house, azimuth 191° 50', distance 180.2 feet; nail in blaze on wild cherry tree, azimuth 317° 54', distance 53.7 feet; bronze tablet stamped "470".....	470.563

	Feet
B. M. 97, on east side of Ash Bottom road, at Wanona avenue; southeast corner of frame house, azimuth 104° 34', distance 51.8 feet; nail in blaze on water oak tree, azimuth 217° 10', distance 48.3 feet; bronze tablet stamped "471".....	471.688
B. M. 98, on sidewalk at southeast corner of Pocahontas avenue and Louisville & Nashville R. R. right of way; southeast corner of retaining wall of culvert abutment, azimuth 76° 51', distance 38 feet; southwest corner to C. T. John's saloon, azimuth 170° 53', distance 71 feet; bronze tablet stamped "472"	472.710
B. M. 99, on north side of Woodlawn street at top of hill, 1,579 feet south of railroad crossing; nail in blaze on elm tree, azimuth 143° 32', distance 18 feet; nail in small cottonwood tree, azimuth 67° 02', distance 73.7 feet; bronze tablet stamped "479"	479.574
B. M. 100, on north side of Phillips Lane, about 200 feet southeast of old Phillip's house; nail in hackberry tree, azimuth 250° 32', distance 50.5 feet; nail in apple tree, azimuth 131° 06', distance 10.3 feet; bronze tablet stamped "484".....	484.602
B. M. 101, on east side of Preston street road, at Phillips lane west; nail in elm tree, azimuth 18° 26', distance 67.4 feet; nail in locust tree, azimuth 321° 04', distance 49.9 feet; bronze tablet stamped "514"	504.077
B. M. 102, on west side of Preston street road, at Hess lane northeast; southeast corner of school house, azimuth 30° 54', distance 63.4 feet; southeast corner of culvert, at junction of Hess lane, azimuth 258° 48', distance 35.3 feet; bronze tablet stamped "506".....	506.578
B. M. 103, on east side of Hess Lane at Prindell avenue northwest; nail in telephone pole at corner, azimuth 186° 47', distance 45.3 feet; nail in blaze of wild cherry tree, azimuth 144° 47', distance 140.6 feet; bronze tablet stamped "506"	506.746
B. M. 104, on southwest corner of Hess lane and Poplar Level pike; nail in corner of fence post; azimuth 312° 52', distance 51.2 feet; nail in blaze on locust tree, azimuth 280° 27', distance 103.5 feet; bronze tablet stamped "518".....	517.999
B. M. 105, Poplar Level pike and Grays lane; nail in blaze on small elm tree, azimuth 176° 34', distance 43.7 feet; nail in blaze on large sycamore tree, azimuth 272° 25', distance 54.7 feet; bronze tablet stamped "507"	507.309
B. M. 106, on south side of Newburg pike at lane south at bridge; northeast corner of stone culvert, azimuth 152° 40', distance 2.9 feet; nail in blaze on sycamore tree, azimuth 336° 15', distance 17.5 feet; bronze tablet stamped "457".....	457.589
B. M. 107, south side of Newburg pike at Ropewalk lane north; nail in blaze on maple tree, azimuth 212° 30', distance 75.9 feet; nail in blaze on locust tree, azimuth 144° 17', distance 37.4 feet; bronze tablet stamped "526"....	526.285

	Feet
B. M. 108, north side of Taylorsville road at Ropewalk lane south, nail in blaze on large sycamore tree, azimuth 129° 41', distance 71.4 feet; nail in blaze on maple tree, azimuth 56° 04', distance 78.4 feet; bronze tablet stamped "533".....	532.771
B. M. 109, on southeast corner of Baxter and Edenside avenues; center of hydrant, azimuth 96° 50', distance 57.1 feet; center of manhole, azimuth 295° 40', distance 10 feet; bronze tablet stamped "538".....	537.875
B. M. 110, on southeast corner of Baxter and Lucia avenues, corner of grocery store, azimuth 42° 55', distance 20.8 feet; center of hydrant, azimuth 293° 40', distance 8.9 feet; bronze tablet stamped "517".....	517.600
B. M. 111, on northwest corner of Baxter and Christy avenues; east corner of saloon, azimuth 141° 20', distance 15.1 feet; J. E. Kirchdorfer's hardware store, azimuth 331° 27', distance 55.2 feet; bronze tablet stamped "487"	487.388
B. M. 112, on southwest corner of Baxter avenue and Underhill street; corner of saloon, azimuth 141° 19', distance 9.2 feet; corner of brick building, azimuth 329° 20'; bronze tablet stamped "468".....	468.330
B. M. 113, north end of parking of Cherokee parkway at Willow avenue west; northeast corner of porch of Belvoir apartments, azimuth 113° 55', distance 77.7 feet; hydrant, azimuth 240° 33', distance 88.9 feet; bronze tablet stamped "505"	505.453
B. M. 114, on Cherokee park and Longest avenue, northwest corner of drive along west side of Cherokee park; nail in elm tree, azimuth 54° 37', distance 64.9 feet; corner of stone wall, azimuth 132° 11', distance 19.9 feet; bronze tablet stamped "468".....	468.489
B. M. 115, on southeast corner of Workhouse road and Long Cliff avenue north; center of fire plug, azimuth 214° 19', distance 47.2 feet; southeast corner of warehouse, azimuth 147° 33', distance 62.6 feet, bronze tablet stamped "460".....	460.690
B. M. 116, at northwest corner of Long Cliff and Peterson avenues; nail in elm tree, azimuth 144° 28', distance 52.2 feet; nail in blaze on small sycamore tree, azimuth 274° 21', distance 56.5 feet; bronze tablet stamped "461".....	460.901
B. M. 117, on south side of Shelbyville road at Cannons lane south; nail in blaze on locust tree, azimuth 141° 55', distance 162.6 feet; center of pump, azimuth 293° 03', distance 69.6 feet; bronze tablet stamped "548".....	547.854
B. M. 118, at east corner of Workhouse and Shelbyville roads, at St. Matthews; southwest corner of brick foundation to house, azimuth 147° 24', distance 49.2 feet; center of millstone No. 5, azimuth 34° 58', distance 32.6 feet; bronze tablet stamped "550".....	549.976

B. M. 119, at southwest corner of Workhouse road and Cannons lane; nail in blaze on large tree, azimuth 68° 16', distance 104.4 feet; southwest corner stone of culvert, azimuth 337° 30', distance 11 feet; bronze tablet stamped "541"	Feet 541.408
B. M. 120, south side of Workhouse road, 1,935 feet west of Cannons lane; nail in blaze on large tree, azimuth 81° 42', distance 67.8 feet; nail in telephone pole, azimuth 126° 46'; distance 86.4 feet; bronze tablet stamped "542"	542.586
B. M. 121, south side of Workhouse road, 400 feet west of Stiltz lane; telephone post, azimuth 54° 43', distance 25.9 feet; nail in tree, azimuth 285° 12', distance 39 feet; bronze tablet stamped "545"	545.609
B. M. 122, on J. M. Atherton's farm, at gate about 760 feet south of his house; center of stone-lot monument, azimuth 162° 38', distance 130.9 feet; nail in small hackberry tree, azimuth 111° 25', distance 12.5 feet; bronze tablet stamped "544"	544.147
B. M. 123, on north end of road near Alexander's residence and about on Alexander and Cown's property line; nail in blaze on locust tree, azimuth 136° 41', distance 67 feet; west corner of Alexander's porch, azimuth 265° 01', distance 146.9 feet; bronze tablet stamped "532"	532.281
B. M. 124, on Woodbourne avenue, 2,770 feet northeast of Baxter avenue; nail in blaze on hackberry tree, azimuth 110° 46'; nail in blaze on hackberry tree, azimuth 239° 06'; bronze tablet stamped "560"	559.907
B. M. 125, on Taylorsville road at Woodbourne avenue, northeast, south side; nail in blaze on cottonwood tree, azimuth 153° 18', distance 72.4 feet; nail in blaze on cottonwood tree, azimuth 242° 10', distance 103.7 feet; bronze tablet stamped "551"	551.752
B. M. 126, north side Taylorsville road, east end of siding of electric road; telephone pole on Taylorsville road, azimuth 70° 46'; tree, azimuth 132° 36', distance 44 feet; bronze tablet stamped "559"	559.116
B. M. 127, on farm of Dr. Dermatt, north end of private lane, 0.5 mile southeast of Duck's Point; nail in blaze on maple tree, azimuth 40° 36', distance 101.1 feet; nail in blaze on beech tree, azimuth 3° 15', distance 73.7 feet; bronze tablet stamped "544"	544.633
B. M. 128, at entrance to Adam's place, south side of road northwest; north corner of stone gatepost, azimuth 41° 29', distance 8.9 feet; nail in blaze on small cherry tree, azimuth 162° 48', distance 38.2 feet; bronze tablet stamped "544"	544.432

B. M. 129, on north side of Newburg pike, at lane north of Adam's place; west corner of barn, azimuth 254° 10', distance 121.1 feet; west corner of stone gatepost, azimuth 316° 24', distance 64.9 feet; bronze tablet stamped "545"	Feet 545.054
B. M. 130, on south side of Newburg pike, at Mrs. Wilder's private road northeast; nail in blaze on locust tree, azimuth 259° 48', distance 59.6 feet; nail in blaze on elm tree, azimuth 331° 04', distance 32.2 feet; bronze tablet stamped "471"	471.528
B. M. 131, on southwest corner of Gass avenue and Hoertz street; southeast corner of retaining wall, azimuth 263° 31', distance 77.4 feet; store No. 1200, azimuth 349° 31', distance 9.2 feet; bronze tablet stamped "467"	467.592
B. M. 132, north side of Poplar Level road, 113 feet north of T. Thels's house, 700 feet southeast of Texas street; nail in locust tree, azimuth 334° 28', distance 100.6 feet; small locust tree, azimuth 50° 53', distance 41.2 feet; bronze tablet stamped "468"	468.286
B. M. 133, west side of Poplar Level pike just north of Clark's lane; west corner of stone culvert, azimuth 306° 42', distance 59.8 feet; nail in blaze on white oak tree, azimuth 66° 08', distance 37 feet; bronze tablet stamped "477"	476.819
B. M. 134, south side of Poplar Level pike; tree, azimuth 335° 18', distance 31.6 feet; tree, azimuth 112° 52', distance 13.5 feet; bronze tablet stamped "473" (levelman reports this b. m. loose—disturbed)	473.686

The following bench marks were adjusted with those in the preceding list:

U. S. Corps of Engineers b. m. 10, on old abutment on south side of canal about Tenth street, near west end of gate recess; north quadrant of cross in circle	417.143
U. S. Corps of Engineers b. m., west side of approach to Twenty-seventh street bridge, 14 feet south of engine house; top of iron bar	430.364
Louisville, at edge of city, Ahrens & Otts Standard Manufacturing Co., in northeast corner of building; aluminum tablet stamped "465 ADJ 1903"	465.074
Court house, at front entrance, west end of bottom step, Primary Traverse Station No. 1; bronze tablet stamped "463"	463.075

CALDWELL, CRITTENDEN, TRIGG, AND UNION COUNTIES.

The following are the unadjusted results of the precise leveling of a spur line from Blackburn south to Cerulean. The elevations are based upon a bench mark at Blackburn, determined by United States Geological

Survey precise leveling from Duquoin, Ill., and by the precise-level line of the United States Corps of Engineers along Ohio River.

The leveling was done in 1908 by W. H. Monahan.

From Shawneetown, Ill., across Ohio River to Blackburn, Ky., thence east along highway to Henshaw, thence along Illinois Central R. R. to Grove Center.

	Feet
Blackburn, at southwest corner of abandoned store building; iron post stamped "1906".....	347.521
Blackburn, 0.9 mile east of, on south end of terra-cotta drain under road; cross mark.....	339.34
Blackburn, 1.9 miles east of, north side of road, 200 feet east of top of hill; nail in root of maple tree.....	407.67
Blackburn, 3.6 miles east of, 50 feet southwest of road junction, in fence corner; iron post stamped "1906".....	377.487
Blackburn, 5.2 miles east of, 300 feet west of church, on top of hill, 60 feet east of forks; nail in hub on oak tree 2 feet in diameter.....	461.66
Henshaw, 190 feet north of road crossing, at northwest corner of store kept by H. R. Dyer & Co.; iron post stamped "1906".....	371.286
Henshaw, in front of station; top of rail.....	372.3
Henshaw, 1.1 miles east of, north side of bridge "J. E. 40-01"; 5th bolt from east end.....	372.06
Henshaw, 2.2 miles east of, 90 feet east of milepost, north side of bridge "J. E. 41-98"; 3d bolt from west end.....	375.63
Grove Center, in front of station; top of rail.....	387.3
Grove Center, 10 feet west of entrance to Charles Omer's store, in sandstone rock; aluminum tablet stamped "1906".....	390.229
Grove Center, 1 mile east of, 60 feet west of crossing, north side of west end of bridge; top of bolt.....	375.05
Harding, 75 feet east of station; iron post stamped "379 1906".....	378.925
Harding, in front of station; top of rail.....	374.2

From Grove Center along Illinois Central R. R. to Sturgis.

Henshaw, 3.3 miles southwest of, in east face of "Anvil Rock," facing railroad track; aluminum tablet stamped "367".....	367.415
Henshaw, 5.1 miles southwest of, on top of concrete post supporting southeast corner of water tank, chiseled square marked "364".....	364.73
Dekoven, in front of station; top of rail.....	364.6
Dekoven, 0.3 mile south of, in northwest corner of cement post of Ohio Valley Coal Co.'s tipple, aluminum tablet stamped "364".....	364.746

Dekoven, 2.2 miles south of, in brick foundation post at southwest corner of coal mine office; aluminum tablet stamped "388".....	Feet 387.916
Dekoven, 4.1 miles southeast of, in base of signal pole at road crossing; spike marked "368".....	368.53

From Sturgis along Illinois Central R. R. to Sullivan.

Sturgis, on top of bottom bench in step wall on south side of steps, at southwest corner of First Christian Church; aluminum tablet stamped "379 Adj 1908" (re-established by A. S. Winston, Jr.).....	379.307
Sturgis, in front of station; top of rail.....	374.5
Sturgis, 1 mile south of, in pier at north end of bridge No. "J. E. 55-59;" spike marked "362".....	362.16

From Sullivan along Illinois Central R. R. to Hood.

Sullivan, in front of station; top of rail.....	375.6
Sullivan, in west face of sandstone post 2 feet north of front steps to Munn Brothers' store; aluminum tablet stamped "382".....	382.470
Blackford, in front of station; top of rail.....	368.2
Blackford, 0.2 mile southwest of, in northwest stone of north abutment of iron drawbridge over Tradewater River; aluminum tablet stamped "362".....	361.876
Nunns, in front of station; top of rail.....	375.0
Nunns, 0.3 mile southwest of, in sandstone rock 100 feet east of bridge "J. E. 65-14," 20 feet east of road, 200 feet north of road crossing; aluminum tablet stamped "382".....	381.982
Nunns, 0.9 mile southwest of, on north edge of rock cut on west side of track; chiseled square marked "409".....	409.70

From Hood along Illinois Central R. R. to Mexico.

Hood, 300 feet west of north switch stand, 30.5 feet west of west rail at post marked "J. E. 66-52," in ledge of limestone rock; aluminum tablet stamped "444".....	444.268
Hood, in front of station; top of rail.....	448.3
Repton, on west edge, 30 feet north of south end of platform in front of station; iron bolt.....	485.25
Repton, 50 feet east of center of road crossing, 15 feet south of east-west road, 3 feet south of fence corner, 2 feet west of fence line; iron post stamped "482".....	482.585
Repton, in front of station; top of rail.....	484.9
Repton, 2.2 miles southwest of, on southeast side of tracks; chiseled square on drainage pipe.....	522.99

	Feet
Repton, 2.3 miles southwest of, in angle of split-rail fence, 15 feet west of gate at second-class road crossing, 30 feet east of whistle post on southeast side of tracks, 1,000 feet northeast of bridge "J. E. 71-52;" iron post stamped "526"	526.771
Marion, in front of station; top of rail	582.8
Marion, 140 feet south of center of station, on edge of platform; iron bolt	583.88
Marion, at southeast corner of yard of Jack Baker, in sandstone wall on inside of fence line, 1 foot from fence corner; aluminum tablet stamped "594"	594.252
Marion, 2.9 miles south of, 300 feet north of bridge "J. E. 77-38," 90 feet east of track, in top of stone protruding from ground; aluminum tablet stamped "642"	642.048
Crayne, on station platform; iron bolt	643.30
Crayne, in front of station; top of rail	643.3
Crayne, in southwest corner stone of general store kept by N. J. Bishop, opposite station; aluminum tablet stamped "643"	643.111

From Mexico along Illinois Central R. R. to Baker.

Mexico, in front of station; top of rail	493.5
Mexico, 0.1 mile south of, 600 feet south of station, opposite post "J. E. 82-18" on west side of tracks, 2 feet east of right of way fence, in limestone post 6 by 8 by 25 inches; aluminum tablet stamped "491"	491.068
Livingston, in front of water tank (or station); top of rail	370.0
Fredonia, opposite station, at northwest corner of G. H. Rice's pasture; iron post stamped "402"	402.534
Fredonia, in front of station; top of rail	403.9

From Baker Southeast to Cobb.

Baker, in front of station; top of rail	470.8
Baker, 1.2 miles southeast of, 0.2 mile east of signboard, at point of curve, on south side of track, in ledge of limestone; aluminum tablet stamped "494"	494.190
Crider, in foundation stone of cistern well at southeast corner of Crider's store; aluminum tablet stamped "469"	469.662
Crider, in front of station; top of rail	466.5
White Sulphur, in front of station signboard; top of rail	500.5
White Sulphur, 1.7 miles southeast of, inside of south right-of-way fence, 75 feet southwest of whistle post, in rock post 6 by 6 by 30 inches; aluminum tablet stamped "548." (Not found in 1908.)	548.070
Princeton, in front of station; top of rail	483.6
Princeton, in top of stone between two concrete columns 10 feet south of entrance of Hotel Henrietta; aluminum tablet stamped "489"	489.422

	Feet
Princeton, 2.8 miles southeast of, 40 feet west of north end of bridge "J. E. 102-12," in top of sandstone ledge; aluminum tablet stamped "471"	471.380
McGowan, 150 feet north of station, on west side of track, 30 feet west of west rail, in limestone ledge; aluminum tablet stamped "484"	484.295
McGowan, in front of station; top of rail	490.9
Otter Pond, at northeast corner of station; iron post stamped "544." (Station reported burned in 1908)	544.567
Otter Pond, in front of station; top of rail	543.9

From Cobb to Cerulean.

Cobb, in front of station; top of rail	462.9
Cobb, at southwest corner of store occupied by S. C. Sizemore, opposite station, north side of track at road crossing; iron post stamped "462"	462.687
Cobb, 2 miles southeast of, in right of way fence corner, southwest side of track opposite northernmost section house; iron post stamped "438"	437.943

At Cerulean.

Cerulean, 0.2 mile west of station, on south side of west abutment of bridge "J. E. 113-96;" aluminum tablet stamped "Prim. Trav. Sta. No. 20, 1907, 455"	454.921
Cerulean, in front of station; top of rail	457.8
Cerulean, 1.3 miles southeast of, in fence corner on south side of track, 150 feet east of signpost "Cerulean 1 mile;" iron post stamped "471"	471.419
Cerulean, 1.3 miles southeast of, 40 feet north of signboard "Cerulean 1 mile," south of north right of way fence, in limestone rock 10 by 10 by 30 inches; aluminum tablet stamped "477"	477.779

PRIMARY LEVELING.

BOYD, CARTER, LAWRENCE, AND ELLIOTT COUNTIES.

The elevations in the following list are based upon a bronze tablet at Kenova, W. Va., in the west side of the doorsill at the entrance to the men's waiting room at Union Station. The elevation of this tablet is accepted as 566.818 feet above mean sea level. The initial height from which these elevations are derived is that determined for B. M. 316 A of the Ohio River Survey, Corps of Engineers, U. S. A., at Catlettsburg, Ky.

The leveling was done in 1900 by J. E. Buford, except a part in Kenova and Louisa quadrangles, which was done by C. H. Semper.

From Haverhill, Ohio, to Greenup, Ky., thence along Eastern Kentucky Ry. to Argillite.

	Feet
Greenup, county building, at right of entrance to clerk's office, set vertically in stone step; bronze tablet stamped "538 I"	539.904
Riverton, 1.5 miles south of, railroad bridge 150 feet south of road crossing, on abutment at southwest corner of bridge; chisel mark	554.60
Argillite, 1,320 feet south of, east side of north end of Argillite Tunnel, 8.9 feet higher than top of rail, in sandstone ledge; bronze tablet stamped "567 K 1900"	566.342

From Greenup south to mouth of Whetstone Creek.

Greenup, 2.5 miles southwest of, 750 feet southwest of log house, on north side of road, in south end of sandstone bowlder 7 by 10 by 25 feet; bronze tablet stamped "578 I"....	579.981
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From Kenova along Chesapeake & Ohio Railroad to Rockville Ky. (Buchanan).

Savage, 2.6 miles north of, on west side of highway crossing, ing, 40 feet from center of track and 10 feet from center of highway, on sandstone ledge; chisel mark	552.34
Savage, 870 feet north of station, at southeast corner of highway bridge; bridge seat; chisel mark	541.16
Savage, in front of station; top of west rail	547 0
Savage Branch station, 1 mile south of, David Lockwood's house, in foundation on left side of front steps; bronze tablet stamped "586 K"	586.013
Lockwood, in front of station; top of east rail	544 2
Cavanaugh Church, in front of flag station; top of east rail	581.2

From Bolts Fork north via Cannonsburg to Ashland.

	Feet
Bolts Fork, 600 feet north of postoffice, highway bridge over Bolts Fork, at southeast corner bridge seat; bronze tablet stamped "652 K"	652.467
Mavity, 0.8 mile north of, at forks of road 105 feet south of log house, 51 feet south of sycamore, on abutment at southwest corner of bridge; chisel mark	604.98
Cannonsburg, southeast corner of post-office building, 93 feet from railroad crossing; bronze tablet stamped "604 K"	604.771
Meads station, 0.5 mile south of, on Ashland Coal & Iron Ry., 200 feet southwest of house on west side of road, on corner-stone at west end of culvert; chisel mark	590.82
Meads station, 1 mile north of, 81 feet north of small bridge, 15 feet east of center of road, in sandstone bowlder; bronze tablet stamped "638 K"	639.121
Ashland, Chesapeake & Ohio Ry. station, on Carter avenue between 12th and 13th streets, south side of building, 2 feet higher than ground; bronze tablet stamped "556 K"	556.431

From Ashland along Chesapeake & Ohio Ry. via Catlettsburg to Hampton.

Ashland, 1.5 miles east of, on Chesapeake & Ohio Ry. girder bridge over electric railway, on top stone at south end of west wing wall; chisel mark	555.64
Catlettsburg, Louisa street, between Franklin and Clay streets, in courthouse yard, northwest corner of clerk's office, 1 foot above water table; aluminum tablet stamped "549 K 1900"	550.203
Catlettsburg, Big Sandy National Bank (U. S. Engineers b. m. 316 A), on window sill; chisel mark "U. S. B. M."	548.588

From Buchanan west to Mayhew.

Buchanan, in front of station; top of east rail	558.2
Buchanan, 150 feet south of, overhead railway bridge (B. S. 189), in top of stone at east end of north pier; bronze tablet stamped "554 K 1900"	554.131
Mayhew, 850 feet west of postoffice, at northeast corner of bridge over Bolts Fork creek, 4 feet lower than bridge, on bridge seat; chisel mark	682.08

From Buchanan south along Chesapeake & Ohio Ry. to Gallup.

Buchanan, 1.7 miles south of, trestle No. 206, in guard rail at southeast end; top of bolt	562.93
Fullers, 300 feet north of station, 5 feet west of railroad at east edge of highway, 30 feet north of white house, in sandstone ledge; bronze tablet stamped "572 K 1900"	570.774
Potters, in front of station; top of rail	573

Louisa, U. S. Engineers' b. m. 13, Big Sandy at Lock No. 3, in Engineer's office yard	Feet 568.981
Louisa County courthouse, north face, west side, in foundation; aluminum tablet stamped "584 K 1900"	582.319
Gallup, G. C. McClure's house, in stone step; bronze tablet stamped "591 K 1900"	589.270
Gallup, 0.6 mile west of, U. S. Engineers b. m. 5, Big Sandy, 50 feet south of west end of trestle No. 403	590.189

From Gallup west to Prosperity.

Adams, 2 miles south of postoffice, M. R. Hayes's residence, in southwest corner of foundation; bronze tablet stamped "667 K 1900"	666.491
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From Irad north 5 miles, thence southeast via Yatesville to Louisa.

Yatesville, 3 miles northwest of, in field, 45 feet south of center of road, 135 feet from southwest corner of Green Valley schoolhouse, in north side of large sand rock; bronze tablet stamped "598 K 1900"	596.756
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From Mayhew west to Denton, thence northeast along Chesapeake & Ohio Ry. to Princess, thence east to Cannonsburg.

Denton, 4.5 miles east of, on top of hill, 60 feet north of road, at old road going north, old abandoned frame house, on foundation at southeast corner; chiseled square	905.29
Denton, Chesapeake & Ohio Ry. station, 200 feet northeast of, 16 feet east of center of main track, on top stone; chisel mark	669.74
Denton, 1.5 miles northeast of, 200 feet north of road crossing at southwest end of Mean's tunnel on Chesapeake & Ohio Ry., 15 feet west of highway, in sandstone ledge; bronze tablet stamped "787 K 1900"	787.694
Grant station, girder bridge No. 11, 30 feet west of switch stand near station, at southwest corner of bridge, on bridge seat; chisel mark	685.82
Geigersville, 800 feet north of Rush postoffice, 600 feet south of coal dump, 330 feet south of road crossing, at southwest corner of railroad bridge No. 10, in bridge seat; bronze tablet stamped "639 K 1900"	639.342
Coalton station, west of tool house near, at northeast corner of railroad bridge No. 6, bridge seat; chisel mark	614.93

From Argillite southeast via Naples to Princess.

Naples, 1,300 feet north of postoffice, at southwest corner of overhead highway bridge across East Fork creek on or near Boyd-Greenup county line, in bridge seat; bronze tablet stamped "571 K 1900"	Feet 570.739
Princess, 3.25 miles northwest of, at northeast corner of highway bridge over Williams creek, east of log house, on abutment bridge; chisel mark	571.57

From Argillite southwest via Oldtown and Euclid, thence north to head of Clay Lick Creek (single spur line).

Oldtown, Mrs. Womack's house, 350 feet north of Oldtown creek bridge, west side of road, in foundation stone on east side of house, 6 feet from southeast corner; bronze tablet stamped "558 K 1900"	556.743
Clay Lick Creek, head of, on ridge where road turns to right to go down Clay Lick, near where schoolhouse was, on north side of road between J. H. Hally's and W. J. Hally's, in ledge; bronze tablet stamped "957 K 1900"	956.245

From Oldtown south to Hopewell, thence south along Eastern Kentucky Ry. to Grayson.

Grayson, 0.4 mile west of railroad, at southeast corner of foundation of courthouse; aluminum tablet stamped "686 K 1900"	684.896
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From Grayson east via Seney to Kilgore.

Grayson, 5.6 miles east of, on north side of road, 15 feet from center of road, near top of Brib Hill, in sandstone ledge; bronze tablet stamped "834 K 1900"	832.774
Kilgore, 1.3 miles west of, in road between W. C. Hargio's residence and the old store of Norton Iron Works, on sandstone boulder; chisel mark	661.24

From Grayson south along Eastern Kentucky Ry. to point 0.5 mile east of E. K. Junction.

Grayson, 0.5 mile south of, at southeast corner of railroad bridge over Little Sandy River, on abutment; chisel mark	588.59
E. K. Junction, 0.5 mile east of, Chesapeake & Ohio Ry. bridge No. S 442, at southwest corner of, on bridge seat; chisel mark	603.93

From point 0.5 mile east of Eastern Kentucky Junction along
Eastern Kentucky Ry. to Willard.

Willard, 3.0 miles north of, 6 feet from southwest corner of railroad bridge No. 9, on abutment; chisel mark.....	Feet 613.50
Willard, 1,400 feet east of station, railroad bridge No. 15 over Dry Fork, at northeast corner of, in bridge seat; bronze tablet stamped "625 K 1900"	624.362

From Willard southeast along Eastern Kentucky Ry. to
Webbville, thence south along public road via
Ironton Hill to Blaine.

Webbville, 5.8 miles south of, south of small house near south of forks of road, on west side, 30 feet from center of, in sandstone ledge; bronze tablet stamped "916 K 1900"	914.826
Cherokee, 0.5 miles north of mouth of Cherokee Creek, east of road, south of small house, in sandstone ledge; bronze tablet stamped "646 K 1900"	645.487

From Blaine west along Blaine Creek to Martha, thence north
via Sarah to Willard.

Blaine, 0.3 mile west of, at northwest corner of highway bridge over Blaine Creek, on bridge seat; chisel mark ...	655.84
Martha, 0.4 mile north of, on east side of road, 25 feet higher than road, 36 feet north of oak tree on same side of road, in sandstone ledge; bronze tablet stamped "736 K 1900"	735.454
Fleiden, 2.0 miles east of, at Pennington's store, near mouth of Hurricane Creek, on south side of road, in foundation under northeast corner of W. L. Pennington's house; bronze tablet stamped "698 K 1900"	696.821
Willard, 5.0 miles southwest of, on west bank of Little Fork Creek, 0.5 mile north of Levi Pennington's, in sandstone ledge between public road and creek; bronze tablet stamped "650 K 1900"	649.625

From Blaine Creek northeast via Prosperity to Irad.

Irada, 2.0 miles west of, 0.25 mile east of log schoolhouse, on north bank of Blaine Creek on south side and 5 feet from center of road, west of house near, in large sand rock; bronze tablet stamped "630 K 1900"	629.684
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FLOYD, JOHNSON, KNOTT, LAWRENCE, LETCHER, AND PIKE
COUNTIES.

The leveling was done as follows: In Goodloe, Hind-
man, and Virgie quadrangles, in 1912, by S. R. Archer;
in Inez and Paintsville quadrangles, in 1909, by Archer;

in Regina quadrangle, in 1912, by C. W. Arnold; in Pound
quadrangle, in 1912, by Archer, Arnold, and H. S. Sen-
seney, and in 1913 by Archer; in Laynesville and Virgie
quadrangles, in 1912 and 1913, by Archer; and in Cor-
nettsville and Oven Fork quadrangles, in 1913, by Archer.

From point near Bosco northeast along highway down right
fork of Beaver Creek to Stevens Branch.

Ballard, 2.3 miles north of, at road forks at old Hueysville postoffice building on east side of road forks; copper nail in stump, marked "685.3"	Feet 685.61
Bosco, 1.1 miles southwest of, in northeast corner of front yard of residence of Mrs. Helen Gerhart, west end of loop in road and Beaver Creek, west side of road, 230 feet south of bend in road to east; copper nail in root of 6-inch locust tree, marked "689-3"	689.12
Bosco, at mouth of Brush Creek, 90 feet north of road forks, 220 feet north of crossing of Brush Creek, 80 feet north of Allen's store, on west side of road, in face of rock ledge; aluminum tablet stamped "675"	675.153
Bosco, 0.6 mile northeast of, at milldam across Beaver Creek, 100 feet north of mouth of Beaver Creek, west side of Little Middle Creek, west side of gate, north side of road; nail in log retaining wall, marked "662-8"	662.61
Bosco, 1 mile northeast of, at crossing of small branch from north, 80 feet southwest of front of residence of Job Turner, north side of road, west side of branch; nail in root on north side of ash tree, marked "675"	674.84
Langley, 1.9 miles southeast of, top of hill in front of barn standing in field on east side of road, opposite mouth of Goose Creek, west side of road, 60 feet south of hilltop; nail in root on north side of 2-foot oak tree, marked "785.95"	785.77
Langley, 1.4 miles southeast of, northeast corner of bridge over small creek from west, at private road northwest to residence of Tom Osborne, 340 feet north of forks with road leading southeast up Goose Creek; nail in trunk of 2½ foot sycamore tree, marked "664.4"	664.21
Langley, 0.8 mile southeast of, summit of road crossing at point of ridge, east side of road, inside of fence above and north of residence of Ballard Martin; nail in root of 1-foot elm tree, marked "720.3"	720.16
Langley, on bank west side of road, 400 feet north of bridge over mouth of Wilsons creek, 200 feet north of store, 375 feet northwest of schoolhouse, in face of rock outcrop; aluminum tablet stamped "673"	672.800

	Feet
Langley, 1.1 miles northeast of, south side of mouth of Sam Mays Branch, 275 feet south of Sam May's store, west bank of Beaver Creek, east side of road; nail in root of 2-foot elm tree, marked "652".....	651.76
Langley, 1.8 miles northeast of, southeast corner of plank bridge over mouth of Henrys Branch, at second-class road to east; chiseled square on flat stone, marked "650.6".....	650.36
Langley, 2.9 miles northeast of, east side of road, 125 feet west of road crossing small branch from east, 275 feet north of Preston & Co.'s store, 360 feet north of residence of Mrs. Otter Preston, in face of rock ledge; aluminum tablet stamped "674".....	673.867
Alphoretta, 2.1 miles west of, at mouth of small branch from south, at residence of George Allen, under northwest corner of log shed on south side of road at third-class road south; chiseled square on top of stone foundation, marked "654.4".....	654.21
Alphoretta, 1.2 miles northwest of, at bend of road to south, opposite mouth of Stevens Branch, on west side of road; nail in root on west side of 2-foot oak tree, marked "717.6".....	717.41

From Prestonsburg north along Chesapeake & Ohio Ry. down Levisa Fork of Big Sandy River to East Point.

Prestonsburg, 0.4 mile southeast of, at mouth of Town Branch, east concrete abutment of undergrade crossing; chiseled square on top of south end of bridge seat, marked "635.6".....	635.33
Prestonsburg, steel highway bridge over Big Sandy River, in top of south end of west abutment of west approach; aluminum tablet stamped "641".....	640.688
Prestonsburg, in front of station; top of west rail.....	637.2
Prestonsburg, 1.5 miles north of, 500 feet south of Cliff station, north concrete abutment of Chesapeake & Ohio Ry. bridge No. 727; chiseled square on top of west end of parapet wall, marked "635.0".....	634.72
Cliff, in front of station; top of rail.....	635.7
Prestonsburg, 2.6 miles northeast of, west side of track and road, 330 feet north of crossing, 645 feet north of school-house; spike in base of telegraph pole, marked "633.2".....	632.92
Prestonsburg, 3.5 miles northeast of, east side of track at mouth of hollow from west; spike in base of telegraph pole, marked "627.45".....	627.14
Auxier, 2.6 miles south of, 0.9 mile southeast of mouth of Fryleys Branch, 420 feet south of milepost 470-E 58, 500 feet south of house owned by William Music, on west side of track; top of north end of concrete culvert at cattle guard; aluminum tablet stamped "627".....	626.683

	Feet
Auxier, 1.8 miles south of, at mouth of Fryleys Branch, in front of house standing on west side of track, 120 feet north of culvert, at private road crossing, top of southwest corner of cattle guard; painted bolthead, marked "631.9"....	631.62
Auxier, 0.8 mile southeast of, concrete under grade crossing at Mary Luck mine, west concrete abutment; chiseled square on top of south end of bridge seat, marked "628.7".....	628.38
Auxier, southeast corner of station platform; chiseled square on top of concrete curbing, marked "630.3".....	629.97

From Hindman along highways south to Carr Fork, thence east to a point near Pine Top, thence northeast to Dema, thence north down Right Fork of Beaver Creek, southwest up Salt Lick Creek, south down Mill Branch, and west down Bald Fork to Vest.

Hindman, 2 miles west of, 0.05 mile south of mouth of Augdon Branch, east side of road, in rock cliff; aluminum tablet stamped "1015".....	1,015.709
Hindman, 0.8 mile west of, in front of Robert Amburgey's residence, at road crossing on Amburgey's Branch, south side of road, west side of branch; copper nail in root of basswood tree, marked "1021.9".....	1,021.91
Hindman, in southeast corner stone of foundation to Knott County courthouse; aluminum tablet stamped "1032".....	1,032.086
Hindman, 0.5 mile southeast of, 140 feet west of Hubbard Francis Branch, south side of road, east side of street south at fence corner; copper nail in 6-inch walnut tree, marked "1042.4".....	1,042.37
Hindman, 1 mile southeast of, southeast corner of creek intersections at mouth of creek from east; paint mark on fence board, marked "1031.9".....	1,031.89
Hindman, 1.5 miles southeast of, opposite mouth of Perkins Branch, south end of small drain at road forks; chiseled square on top of stone, marked "1061.4".....	1,061.34
Hindman, 2.2 miles southeast of, at mouth of Parks Branch, at residence of A. L. Hale, northeast corner of plank bridge; chiseled square on top of stone, marked "1049.1"....	1,049.12
Hindman, 2.8 miles southeast of, 60 feet southwest of center of road forks at mouth of Trace Fork, at foot of fence post at small buckeye tree; chiseled square on top of stone, marked "1076.0".....	1,075.98
Hindman, 3.6 miles southeast of, 0.7 mile south of mouth of Trace Fork, 0.2 mile north of Shade Stacey's residence, west side of road, 60 feet south of house on west side of stream crossing, in top of large stone; aluminum tablet stamped "1100".....	1,099.834

Hindman, 4.4 miles southeast of, at head of Trace Fork, at forks of creek and road leading southwest to Irishmans Creek, in bed of creek at junction; chiseled square on top of large rock, marked "1178.0"	1,177.96
Hindman, 5.1 miles southeast of, south side of gap between Trace Fork and Betty Troublesome Creek, 75 feet south of schoolhouse, at bend in creek northeast, east side of road, in bed of creek; chiseled square on top of large rock, marked "1302.6"	1,302.60
Hindman, 6.1 miles southeast of, 1.7 miles north of Carr Fork, east side of road at forks of Betty Troublesome Creek, 150 feet south of forks; copper nail in root of 2-foot beech tree, marked "1152"	1,151.94
Hindman, 7 miles southeast of, 1 mile north of mouth of Troublesome Creek, 60 feet south of forks of creek at Link Toliver's store, east side of forks; chiseled square on top of rock ledge, marked "1088"	1,087.94
Hindman, 8 miles southeast of, 200 feet north of mouth of Troublesome Creek, 40 feet south of Finley Bentley's store, east side of road, at fence line, on Carr Fork; chiseled square on top of large rock, marked "1035.95"	1,035.90
Pine Top, 4.3 miles southwest of, 635 feet east of mouth of Troublesome Creek, north bank of Carr Fork, south side of road, 20 feet from water's edge, in top of large rock; aluminum tablet stamped "1034"	1,034.444
Pine Top, 3.4 miles southwest of, at mouth of hollow from south, at bend in road to east, 400 feet southeast of Jeff Bentley's residence, south side of road; copper nail in root of soft maple tree, marked "1052.3"	1,052.22
Pine Top, 2.7 miles southwest of, 350 feet north of mouth of Smiths Branch, on west side of road at road forks, at northeast corner of schoolhouse yard, at foot of corner fence post; chiseled square on top of stone, marked "1059.8"	1,059.74
Pine Top, 2.1 miles southwest of, north side of creek at mouth of Steer Fork, south side of road; copper nail in root of center one of three sycamore trees, marked "1,065.0"	1,064.98
Pine Top, 1.2 miles southwest of, 200 feet east of Alexander Martin's residence, at bend in Carr Fork to east, bench in road to north, east side of road, 10 feet south of telephone pole at fence line; copper nail in stake, marked "1077.1"	1,077.06
Pine Top, 0.5 mile west of, 600 feet north of road forks, in bed of creek on west side, at mouth of Muddy Fork or Branham's Creek, in rock ledge; aluminum tablet stamped "1093"	1,092.550
Pine Top, 0.5 mile west by 1 mile north of, at residence of Joseph Reynolds, on east bank of Branham's Creek, in mouth of creek from east; chiseled square on top of large rock, marked "1149.5"	1,149.38

Pine Top, 0.5 mile west by 1.7 miles north of, in center of road forks, at road leading west through gap to head of Right Fork of Troublesome Creek; copper nail in base of telephone pole, marked "1206.7"	1,206.59
Pine Top, 0.5 mile west by 2.2 miles north of, at foot of south side of hill between heads of Branham's Creek and Caney Fork, in bed of creek, on north side of road, at bend in road to northeast; chiseled square on top of rock, marked "1284.4"	1,284.33
Pine Top, 0.5 mile west by 2.4 miles north of, at top of divide between heads of Branham's Creek and Caney Fork, west side of road; chiseled square on top of stone, marked "1475.5"	1,475.41
Hollibush, 4 miles southwest of, forks of Caney Fork at foot of north side of divide between heads of Branham's Creek and Caney Fork, 15 feet south of intersection of creeks, west side of creek; chiseled square on top of stone, marked "1190.4"	1,190.33
Hollibush, 3.2 miles southwest of, 200 feet north of road forks at road leading southwest to head of Right Fork of Troublesome Creek, on east bank of Caney Creek, in face of rock ledge; aluminum tablet stamped "1093"	1,092.898
Hollibush, 2.6 miles southwest of, south side of road, at fence line, opposite and 120 feet west of mouth of Trace Fork, 585 feet west of schoolhouse; chiseled square on top of large rock, marked "1035.4"	1,035.30
Hollibush, 1.7 miles southwest of, 350 feet northeast of creek to south, north side of road, at west end of rock ledge; chiseled square on top of large rock, marked "970.4"	970.28
Hollibush, 0.8 mile west of, at foot of point on east side of creek, 75 feet southeast of private road west, at bend in Caney Fork to south; chiseled square on top of large rock, marked "912.6"	912.50
Hollibush, 225 feet east of mouth of Hollibush Creek, in front of schoolhouse, north side of creek, in face of rock ledge; aluminum tablet stamped "873"	872.395
Hollibush, 0.9 mile northeast of, at mouth of Hemp Patch Branch, at southwest corner of junction of creeks; chiseled square on top of stone, marked "845.8"	845.71
Hollibush, 1.7 miles northeast of, west side of Caney Fork, 75 feet north of mouth of branch from west, on east side of road; copper nail in base of small sycamore tree, marked "827.3"	827.20
Hollibush, 2.4 miles northeast of, on west side of Caney Fork, 75 feet northwest of mouth of Bill Stones Branch; chiseled square on top of large rock, marked "808.8"	808.66

	Feet
Hollibush, 3.3 miles northeast of, 2.2 miles southwest of Raven, at mouth of Huff Branch, northeast corner of creek intersection; copper nail in root of 2½-foot beech tree, marked "790.3"	790.22
Raven, 1.5 miles west of, east side of Caney Fork, 30 feet south of road crossing, opposite mouth of Gibsons Branch, in face of rock ledge; aluminum tablet stamped "776"	775.444
Raven, 0.8 mile west of, east side of creek, north side of road at road crossing on Caney Fork; chiseled square on top of large rock, marked "759.3"	759.16
Raven, in southwest corner of foundation to store of Green Sloan; chiseled square on top stone of, marked "749.1"	749.01
Dema (mouth of Caney Fork), 0.7 mile west of, at bend in Caney Fork to southeast, 0.3 mile northwest of mouth of Grassy Gap Branch, on north side of creek at water's edge, 45 feet southeast of buckeye tree, 140 feet northwest of beech tree; chiseled square on top of large rock, marked "720.6"	720.51
Dema, 140 feet east of store of Kune Sloan, on south side of road; chiseled square on top of stone	712.80
Dema, west bank of Beaver Creek, 160 feet south of mouth of Caney Fork, in face of rock cliff; aluminum tablet, stamped "711"	711.100
Dema, 1.6 miles north of, 170 feet north of residence of John Saliers, on east bank of Beaver Creek, west side of road; copper nail in root of 18-inch beech tree, marked "714.4"	714.28
Lackey, 3 miles southeast of, 50 feet north of mouth of Mill Creek, on east bank of Beaver Creek, west side of road; copper nail in root of 14-inch elm tree (second tree from south end of row of trees), marked "699.8"	699.65
Lackey, 2.5 miles southeast of, west side of road, south side of Steels Creek at road forks; chiseled square on top of flat rock, marked "701.8"	701.66
Lackey, 1.7 miles southeast of, west side of road, south bank of Martins Branch, at residence of W. J. Martin, at road crossing Martins Branch; copper nail in root of 16-inch walnut tree, marked "701.4"	701.28
Lackey, 0.7 mile southeast of, east end of loop in Beaver Creek to east, 100 feet south of road crossing creek, at foot of small buckeye tree, east side of road and at mouth of branch from east (second branch east of Lackey); chiseled square on top of large rock, marked "709.5"	709.37
Lackey, 110 feet north of road forks (road leading northwest up Jones Fork), west side of small creek and private road from north, 60 feet east and 100 feet north of company store, north side of Beaver Creek, in face of rock ledge; aluminum tablet stamped "695"	694.683

	Feet
Lackey, 0.8 mile northwest of, west side of road, east side of Beaver Creek, 125 feet north of Martin & Martin's store, 20 feet south of east end of swing foot bridge over Beaver Creek; chiseled square on top of flat rock, marked "690.6"	690.40
Lackey, 1 mile northwest of, at mouth of Stone Coal Branch, 50 feet southeast of center of road forks, at fence line; copper nail in trunk of 6-inch sycamore tree, marked "686.5"	686.33
Ballard, just north of mouth of Rock Fork, east side of Beaver Creek, south side of road forks, copper nail in top of 2-inch plank driven in ground at foot of north post of wooden anchor posts to swing foot bridge, marked "683.3"	683.14
Ballard, 1 mile north of, in front of residence of Tom Martin, on south bank of Beaver Creek, north side of road; copper nail in root of 20-inch elm tree, marked "683.9"	683.77
Ballard, 1.7 miles north of, on Salt Lick, 70 feet southeast of mouth of Reeds Branch, east side of road, north side of private road east to residence of Joseph Reed; copper nail in base of corner fence post, marked "672.8"	672.61
Ballard, 2.1 miles north of, at mouth of Salt Lick Creek, 0.2 mile east of road forks, south side of road, at northeast corner of Church and Odd Fellows' Hall, in square stone foundation, east face; aluminum tablet stamped "690"	690.106
Ballard, 2.3 miles north of, east side of road forks at mouth of Salt Lick Creek, southwest corner of old Hueysville post-office building; copper nail in stump foundation, marked "685.8"	685.61
Hippo, 3 miles east of, 0.9 mile west of mouth of Salt Lick, at road crossing, south side of road, east side of John Amburgys Branch; nail in root of 2½-foot elm tree, marked "693.4"	693.28
Hippo, 2.7 miles northeast of, at mouth of Salyers Branch, center of road forks; spike in top of poplar stump, marked "687.7"	687.56
Hippo, 2.1 miles northeast of, opposite and about 0.25 mile east of Cool Water Branch, north side of road and west bank of Mink Branch at crossing; chiseled square on top of flat rock, marked "701.5"	701.31
Hippo, 1.5 miles northeast of, west bank of Raccoon Creek, north side of road to southwest, 60 feet southwest of center of road forks at mouth of Raccoon Creek; chiseled square on top of flat rock, marked "702.9"	702.79
Hippo, 0.3 mile northeast of, at mouth of Lick Fork Branch, east bank of Salt Lick Creek at mouth; chiseled square on top of flat rock, marked "724.0"	723.85

	Feet
Hippo, 550 feet northeast of postoffice, west side of Salt Lick Creek, opposite residence of John Sutton, 800 feet southwest of mouth of Lick Fork Branch, in top of projecting rock of rock ledge; aluminum tablet stamped "733"	733.007
Hippo, 0.9 mile southwest of, just west of residence of Mrs. William Coburn, south bank of Salt Lick Creek, 50 feet east of mouth of Bull Tail Branch; chiseled square on top of rock, marked "790.4"	790.26
Hippo, 1.4 miles southwest of, southwest corner of intersection of creeks, 15 feet north of northwest corner of small corn shed, 210 feet southeast of schoolhouse, at mouth of Snaggy Fork; copper nail in root on south side of 1-foot walnut tree, marked "831.1"	830.96
Handshoe, opposite postoffice, on hillside on north bank of Salt Lick Creek, 20 feet above bed of creek, 60 feet north of mouth of Bark Camp Branch, in face of rock outcrop; aluminum tablet stamped "885"	885.279
Handshoe, 1.4 miles southwest of, at road crossing gap between Salt Lick Creek and Laurel Fork of Quicksand Creek, east side of road, 15 feet south of telephone pole, 40 feet southeast of fence corner, 12 feet south of highest point in road; chiseled square on top of stone, marked "1312.7"	1,312.53
Handshoe, 2.4 miles southwest of, at mouth of Lick Fork on Laurel Fork, west bank of Lick Fork at its mouth, 230 feet south of road forks, opposite and 20 feet north of log barn, in top of rock ledge; aluminum tablet stamped "1146"	1,146.121
Vest, 3.1 miles east by 3.8 miles north of, 3.5 miles northeast of Yellow Mountain postoffice, at foot of north side of Yellow Mountain (divide between Mill Branch of Balls Fork and Lick Fork of Laurel Fork), on east side of road at bend to southeast, at foot of hill; nail in base of a 2-foot gum tree, marked "1244.4"	1,244.27
Vest, 3.1 miles east by 2.8 miles northeast of, 2.4 miles northeast of Yellow Mountain postoffice, top of divide on Yellow Mountain between Mill Branch of Balls Fork and Lick Fork of Laurel Fork, north side of road, 35 feet west of point where road leaves divide to descend to Lick Fork; copper nail in root of 2½-foot oak tree, marked "1630.1"	1,629.94
Vest, 3.1 miles east by 2.3 miles northeast of, 2 miles north of Yellow Mountain postoffice, at top of divide on Yellow Mountain between Mill Branch of Balls Fork and Newmans Fork of Laurel Fork, south side of road, 75 feet east of point where road leaves ridge to descend to Mill Creek; nail in root of 2½-foot oak tree, marked "1629.9"	1,629.76

	Feet
Vest, 3.1 miles east by 1.8 miles north of, 1.4 miles north of Yellow Mountain postoffice, at foot of south side of divide between Mill Branch of Balls Fork and Lick Fork of Laurel Fork, west side of road at mouth of small branch from west, 50 feet south of house standing on west side of road, 40 feet north of stream crossing where road leaves creek to cross divide; chiseled square on top of large flat sandstone rock, marked "1236.6"	1,236.46
Vest, 3.1 miles east by 1.2 miles north of, 0.8 mile north of Yellow Mountain postoffice, 75 feet north of mouth of small branch from east, on west bank of Mill Branch, 360 feet north of residence of John Bolen, east side of road; copper nail in root on west side of 18-inch beech tree, marked "1153.6"	1,153.41
Vest, 3.1 miles east of, along Balls Fork, at road forks, 16 feet above water level, east side and 310 feet north of mouth of Mill Branch, in face of rock ledge; aluminum tablet stamped "1091"	1,090.900
Vest, 2.3 miles east of, on east bank of Balls Fork, 75 feet south of ford of wagon road, in bottom just west of schoolhouse, 0.2 mile north of mouth of Terry Fork, 15 feet north of 2-foot sycamore tree, 75 feet west of large sandstone rock; chiseled square on top of large flat rock, marked "1067.2"	1,067.01
Vest, 1.6 miles east of, 50 feet north of mouth of small creek from northeast, in bed of creek, on west side of road, 35 feet south of bend in road to west; chiseled square on top of large rock, marked "1076.6"	1,076.39
Vest, 1.1 miles east of, opposite mouth of Knob Bottom Branch, west side of Balls Fork, at water level, under oak tree 5 inches in diameter; chiseled square on top of large rock, marked "1047.9"	1,047.77
Vest, 550 feet north of road forks at ford in front of store, 700 feet north of mouth of Trace Fork, on east bank of Balls Fork, west side of road, in top of large rock; aluminum tablet stamped "1044"	1,044.386

From Dema south along highway up Right Fork of Beaver Creek to Isaac Branch.

Dema, 1 mile southeast of, 320 feet north of mouth of Dotty Branch, east side of Beaver Creek, west side of road; copper nail in root of 2-foot beech tree, marked "731.5"	731.37
Dema, 2.1 miles southeast of, northeast corner of creek intersection, 30 feet northwest of southwest corner of log building, at mouth of Saulsbury Branch, 10 feet west of fence, at foot of small post; chiseled square on top of stone, marked "744.0"	743.84

Dema, 3.7 miles southeast of, west side of Beaver Creek, 700 feet north of mouth of Sly Branch, 45 feet south of 2½-foot sycamore tree, in east face of large rock; aluminum tablet stamped "758"	757.653
Dema, 5 miles southeast of, on north bank of Oldhouse Branch at mouth, at bend in creek to southwest, 75 feet south of southwest corner of Richard Hall's barn; copper nail in root of west tree of three elm trees in a cluster, marked "776.9"	776.74
Dema, 6.1 miles southeast of, opposite mouth of Upper Rocklick Branch, on west bank of Beaver Creek, east side of road; copper nail in root of beech stump, marked "792.4" ..	792.30
Republican, 0.6 mile northeast of, 75 feet northwest of mouth of Dry Creek, west side of Beaver Creek, in top of rock cliff; aluminum tablet stamped "799"	799.227
Republican, 0.7 mile southwest of, west side of Beaver Creek, at fence line, 1,200 feet southwest of Spruce Pine Branch, 90 feet west of house, 825 feet northeast of Rowan Branch; copper nail on east side of 1½-foot elm tree in root, marked "821.9"	821.80
Republican, 1.2 miles southwest of, opposite mouth of Waddles Branch, on east bank of Beaver Creek; copper nail in root on creek side of beech tree, marked "832.1"	832.01
Republican, 2.1 miles southwest of, on east bank of Beaver Creek at bend southeast, 150 feet north of bend in road southeast, 0.3 mile south of splash dam; copper nail in root of sycamore stump 20 feet high, marked "847.8"	847.72
Republican, 2.5 miles southwest of, at mouth of Mullens Branch, southwest corner of road forks; copper nail in base of telephone pole, marked "853.9"	853.85
Kite, on west bank of Beaver Creek, 450 feet north of mouth of Bates Branch; in top of projection of rock cliff; aluminum tablet stamped "879"	879.377
Kite, 1.2 miles southeast of, at mouth of Puncheon Creek, on north bank of Beaver Creek, 40 feet southwest of 15-inch walnut tree standing inside of fence on north side of creek; chiseled square on top of rock, marked "912.0"	911.93
Kite, 2.2 miles southeast of, east side of Beaver Creek, in front of tenant house owned by W. J. Hall's heirs; copper nail in root on house side of 2-foot sycamore tree, marked "952.4"	952.28
Kite, 3.1 miles southeast of, on west bank of Beaver Creek, 140 feet northwest of junction of creeks, 650 feet northwest of schoolhouse at road forks at mouth of Isaac Branch (road leading southeast to Mill Creek of Rockhouse Creek), in face of rock ledge; aluminum tablet stamped "999" ..	999.289

Kite, 3.8 miles southeast of, northwest corner of intersection of creeks, 130 feet south of store, 17 feet west of southeast corner of barn of Jefferson Hall, at road forks at mouth of Day Fork (road leading northeast to Jacks Creek); chiseled square in stone foundation pillar, marked "1051.1" ..	1,050.03
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From Gallup south along Chesapeake & Ohio Ry. to point near Buffalo Station.

Gallup, 0.6 mile west of, 50 feet south of west end of old trestle No. 403 (U. S. Corps of Engineers b. m. 5, their elevation being 591.559)	590.189
Gallup, 1.5 miles southwest of, north side of track, in base of milepost "E 93 H 35;" spike	589.70
Gallup, 2.5 miles southwest of, opposite milepost "E 92 H 36," in base of section post 276-277; spike	596.28
Kise station, 0.7 mile northeast of, in top of sandstone rock, at base of milepost "E 91 H 37;" chiseled square ..	589.26
Georges Creek, 60 feet north of station platform, north side of highway, inside fence corner, 30 feet west of elm tree; iron post stamped "608"	607.655
Richardson, 1.9 miles northeast of, 70 feet south of house on west side of railroad, in top of rock on east side of railroad; chiseled square	589.08
Richardson, 180 feet north of Chesapeake & Ohio Ry. station, 20 feet east of track, at fence corner; iron post stamped "601"	600.729
Richardson, 1.1 miles south of, in top of east end of culvert under railroad; chiseled square	599.42
Graves Shoals station, 60 feet west of A. Preston's store, on north side of track, in base of telegraph pole; spike ..	597.38
Graves Shoals station, 0.9 mile southwest of, in top of stone boulder on east side of railroad; chiseled square	602.80
Graves Shoals, 1.6 miles southwest of, 2.0 miles north of Chestnut station, east side of railroad, 3 feet from track, 250 feet south of milepost "E 82 H 46," in rock ledge; aluminum tablet stamped "597"	596.736
Graves Shoals, 2.5 miles southwest of, 1.1 miles north of Chestnut station, 150 feet north and 50 feet west of milepost "E 81 H 47" (U. S. Corps of Engineers b. m. 12, Big Sandy, set in river bank at; their elevation 598.894)	597.012
Chestnut station, 1.0 mile southwest of, 2.0 miles northeast of White House, at house on west side of railroad, 250 feet west of railroad milepost "E 79 H 49," river bank (U. S. Corps of Engineers b. m. 13, Big Sandy, their elevation 605.354)	603.484
White House, 120 feet east of station, southwest corner of road crossing, 30 feet south of crossing, top of stone; chiseled square	607.14

	Feet
White House, 1,000 feet west of station, 120 feet west of post-office, at milepost "H 51 E 77," in top of south end of concrete culvert under railroad; aluminum tablet stamped "592"	591.983
River station (River postoffice), 180 feet south and 50 feet west of station, 75 feet north of postoffice, in front of dwelling house, in fence corner; iron post stamped "615"	615.38
Meeks station, in top of northwest corner of concrete platform curbing at; chiseled square	608.00
Meeks station, 1.5 miles southwest of, at road crossing, east side of railroad, in base of warning post; spike	609.69
Buffalo station, 1.0 mile northwest of, 40 feet west of track, 15 feet west of 10-inch walnut tree, 120 feet north of private crossing, at fence corner; iron post stamped "610"	609.908
Buffalo station, west side of track at platform, in base of station board; spike	623.05
Buffalo station, 0.2 mile southwest of, railroad bridge over Big Sandy River, west wing of north abutment, in top stone; chiseled square	625.60
From Georges Creek along highway up Right Fork to divide and down Wileys Creek to River station.	
Georges Creek, 60 feet north of station platform, 30 feet west of elm tree, north side of highway, inside fence corner; iron post stamped "608"	607.655
Georges Creek station, 0.5 mile west of, on west side of river, at southeast corner of road forks, in front of corn crib, in top of stone; chiseled square	580.88
Georges Creek station, 1.1 miles west of T road southwest at forks of Georges Creek, in southwest corner of road forks, 65 feet east of schoolhouse, in root of small tree; copper nail	571.24
Georges Creek, 2.0 miles west of, T road north at, north side of road, 50 feet west of road forks, in top of stone; chiseled square	584.69
Charley, 1.4 miles southeast of, in center of road forks, in root of 24-inch sycamore tree; copper nail	571.30
Charley, 0.4 mile southeast of, at house on west side of road, in top of west end of stone culvert; chiseled square	623.40
Charley, road forks at, southwest corner of, in front of E. Moor's store, in top of stone; chiseled square	601.37
Charley, 0.4 mile west of, T road southwest at, north side of public road at road forks, at fence corner; iron post stamped "629"	629.106
Charley, 1.3 miles west of, south side of road, 50 feet west of small stream, in top of rock; chiseled square	611.29

	Feet
Charley, 2.2 miles west of, west side of road at road forks, in root of 36-inch cottonwood tree in front of Mr. Hayes's residence; nail	636.69
Charley, 3.4 miles southwest of, north side of road, 90 feet west of bend in road to west, in top of rock; chiseled square	714.32
Charley, 3.6 miles southwest of, at northeast corner of blacksmith shop, 150 feet southeast of house, 60 feet east of small store, 30 feet east of small stream, on fence line south side of public road, at W. Hays's residence; iron post stamped "703"	702.601
Charley, 4.2 miles southwest of, east side of road at T road southeast, in top of stone; chiseled square	743.69
Charley, 5.2 miles southwest of, at foot of south side of divide between right and left forks of Georges Creek, north side of road at bend to south, in root on east side of stump; copper nail	744.87
Lowmansville, 0.6 mile southwest by 1.4 miles northwest of, road forks, at John M. Brown's residence, in center of road forks, in top of stone; chiseled square	681.43
Lowmansville, 0.6 mile southwest by 0.5 mile northwest of, north side of road at forks, in top of sandstone ledge; chiseled square	658.10
Lowmansville, 0.6 mile southwest of, in southwest corner of road forks at schoolhouse, in root of 3-foot beech tree; copper nail	655.37
Lowmansville, 0.8 mile southwest of, T road southwest, 300 feet south of John J. Brown's residence, northwest corner of road forks, at fence line; iron post stamped "651"	650.602
Lowmansville, 2 miles south of, on north side of divide between left fork of Georges Creek and Wileys Creek, private road east, 50 feet east of junction, on south side of road, in top of stone; chiseled square	748.61
River station, 1.1 miles northwest by 2.2 miles north of, 60 feet south of T road west, on west side of road, in top of large sandstone rock; chiseled square	665.31
River Station, 1.1 miles northwest by 1.1 miles north of, 350 feet east of schoolhouse, east side of road at T road northwest, in top of sandstone rock; chiseled square	648.20
River station, 1.1 miles northwest of, east side of road at T road west, in top of sandstone rock; chiseled square	589.63
River Station, 0.2 mile west of, west side of river, in northwest corner of road forks at John Ward's store, 60 feet south of store, in top of lower stone at southeast corner of stone wall; chiseled square	596.36

Big Sandy ford at River station, surface of water in, Nov. 26, 1909	Feet 556
River station (River postoffice), 180 feet south by 50 feet west of station, 75 feet north of postoffice, in front of dwelling house, in fence corner; iron post stamped "615"....	615.323
From Stevens Branch northeast along highway down Beaver Creek to Beaver; thence northeast and northwest along Chesapeake & Ohio Ry. down Levisa Fork of Big Sandy River to Prestonsburg.	
Alphoretta, 0.5 mile north of, west abutment of steel highway bridge over Right Fork of Beaver Creek, at store of T. J. Craft & Co., in top of south end of concrete bridge seat; aluminum tablet stamped "653"	652.451
Alphoretta, 1.8 miles northeast of, at mouth of Buck's Branch, in northeast corner of road forks, southwest corner of store, at Bucks Branch postoffice; chiseled square cut in top of stone foundation, marked "651.4" ..	651.19
Allen, 4.7 miles southwest of, 40 feet northwest of crossing of small stream from northwest, at residence of James Crisp, at bend in Beaver Creek to east, south bank of stream, 40 feet east of barn at fence line, 3 feet south of trunk; nail in root of 3-foot sycamore tree, marked "639.1"	638.89
Allen, 3.3 miles southwest of, 200 feet east of mouth of Arkansas Creek, on west side of road, east bank of Beaver Creek, south end of loop to south, in face of rock cliff; aluminum tablet stamped "639"	639.220
Allen, 2.3 miles southwest of, north side of Becky Clarks Branch at rock crossing on branch, at residence of Columbus Crisp, west side of road; copper nail in root of 1-foot sycamore tree marked "627.7"	627.44
Allen, 1.4 miles southwest of, north side of road, opposite and about 100 feet west of residence of Harmon Beverley, at southwest corner of shop building; painted square on top of rough projection of stone foundation marked "677.6"	677.39
Allen, 0.7 mile south of, north side of small drain from east, east side of road, 6 feet above road, opposite and 100 feet north of house owned by T. J. Allen; chiseled square in top of rock ledge, marked "661.4"	661.13
Allen, 720 feet west of Beaver Creek station, east stone abutment of Chesapeake & Ohio Ry. bridge No. 836 over mouth of Beaver Creek, in top of south end of bridge seat; aluminum tablet stamped "638"	638.098
Dwale, 1 mile northeast of, 360 feet north of private crossing and house east side of track, 500 feet north of culvert over branch from west, east side of track; top of bolt head in south end of cattle guard painted white, marked "648.9" ..	648.69

Woods, 0.5 mile southwest of station, east end of cattle guard, south side of track; bolthead painted white, marked "647.6"	Feet 647.34
Woods, 25 feet north of station platform, 55 feet south of section house, on top of east end of concrete culvert under track; chiseled square, marked "643.6"	643.29
Woods, 0.2 mile north of, north end of siding, in top of east end of concrete culvert under track; aluminum tablet marked "640"	639.590
Alonzo, in front of station; top of west rail ..	642.8
Alonzo, at mouth of Lisleys Branch, east side of track, opposite platform and store of Preston Coal Co., 60 feet south of coal tippie; spike in base of telegraph pole, marked "636.9"	636.62
Alonzo, 0.9 mile northeast of, on west side of track; spike in base of milepost "H 79-E 49" marked "641.6" ..	641.36
Bull Creek station, 0.8 mile southeast of, 100 feet south of private-road crossing, 140 feet south of house on west side of railroad, east side of track, south end of cattle guard, top of bolthead painted white, marked "642.7" ..	642.42
Bull Creek station, northwest of road crossing, east end of cattle guard; top of bolthead painted white, marked "640.6"	640.33
Bull Creek station, 0.2 mile north of, concrete railroad bridge over mouth of Bull Creek, in top of south end of bridge seat, east abutment; aluminum tablet stamped "635"	634.392
Bull Creek station, 1.3 miles northwest of, 40 feet west of milepost 876-E. 52, 130 feet west of house standing on south side of railroad, in top of east end of cattle guard on south side of track; bolthead painted white, marked "640.0"	639.68
Prestonsburg, 0.8 mile southeast of, at Colonial station, south side of track, east side of switch to coal tippie; spike in base of station signboard marked "638.1"	637.83
From point near Coal Run northwest along Chesapeake & Ohio Ry. to Beaver Creek.	
Coal Run station, 1.2 miles southeast of, opposite mouth of Ratliff's Creek, 120 feet south of Samuel Keel's barn standing on east side of track, at branch from west, in top of east end of concrete heading of iron drain under railroad; bronze tablet stamped "670"	670.221
Coal Run station, 30 feet north of track, in west base of telegraph pole; spike	672.89
Keyser station, 3 feet south of station sign, southwest corner of station platform, at mouth of Cabin Branch, in top of timber curbing; copper nail	673.59

Wagner station, 0.2 mile north of, 1,050 feet south of Mossy Bottom station, 510 feet north of milepost H 98 E 30, top of east end of concrete culvert under railroad; bronze tablet stamped "665"	664.964
Mossy Bottom, in front of station; top of rail	670.9
Mossy Bottom station, 0.9 mile northwest of, 500 feet west of milepost H 97 E 31, east side of road at third-class road crossing, in southeast corner of cattle guard; top of bolt-head painted white	669.14
Mossy Bottom station, 1.5 miles northwest of, 100 feet west of Staten Branch, 500 feet east of bend in railroad to north, east side of lane south to house in field, in southeast corner of cattle guard; top of bolt-head painted white	667.79
Boldman station, 0.5 mile northeast of, 300 feet west of center of curve in railroad to south, 150 feet west of house standing on north side of track, east side of lane crossing, in southwest corner of cattle guard; top of bolt-head painted white	666.40
Boldman, in front of station; top of rail	665.1
Harold station, 1.3 miles southeast of, 770 feet west of Boldman station, east end north side of track of Chesapeake & Ohio Ry. stone arch culvert over mouth of Hurricane Creek, in top; bronze tablet stamped "653"	652.930
Harold station, 12 feet south of south end of platform to station, in top of northeast corner of concrete foundation of Chesapeake & Ohio Ry. water tank, on track side; chiseled square	663.30
Harold station, 0.3 mile north of, on top of south abutment at west end of parapet wall of railroad bridge 931 over mouth of Mud Creek; chiseled square	663.11
Betsy Layne station, 0.5 mile southeast of, 80 feet north of whistling post, 525 feet south of milepost H 92 E 36, west side and 1 foot lower than track, at foot of rock cliff, in top of stone projection; chiseled square	661.89
Betsy Layne, in front of station; top of rail	661.7
Betsy Layne station, 780 feet west of, north side of track, at mouth of Betsy Layne Branch, in top of east end of concrete culvert under railroad; bronze tablet stamped "646"	646.226
Betsy Layne station, 0.6 mile northwest of, 750 feet south of mail crane and house standing on east side of track, 120 feet south of milepost H 91 E 37, in top of cattle guard on west side of track; bolt-head painted white	661.76
Betsy Layne station, 1.6 miles northwest of, opposite and about 0.25 mile northwest of mouth of Mare Creek, 150 feet west of house standing in mouth of hollow, on south side of track, 390 feet east of milepost H 90 E 38, 720 feet east of Tram postoffice mail crane, on top at south end of concrete culvert under railroad; chiseled square	657.96

Ivel station, 1.5 miles southeast of, 90 feet west of railroad culvert over mouth of Camp Branch, east side of third-class road crossing at east end of cut, north side of track, in base on track side of chestnut post 6 feet high; top of head of ½-inch bolt painted white	656.58
Ivel station, 0.5 mile south of, 300 feet north of Straten Branch, 130 feet north of house, west side of track, in cattle guard; top of center bolt-head painted white	655.92
Ivel station, 150 feet north of, east side of track, at cattle guard, north side of east end of concrete culvert under railroad, in top; bronze tablet stamped "653, Ky."	652.742
Ivel station, 0.9 mile northwest of, 210 feet northwest of milepost H 87 E 41, 400 feet north of drain from west and house in mouth of hollow, north side of track, on top of concrete culvert under railroad; chiseled square	654.51
Banner station, 0.5 mile southeast of, 170 feet west of milepost H 86 E 42, 30 feet west of whistling post, 300 feet west of house on south side of track, at mouth of hollow from south, north side of track, in east end of cattle guard; top of bolt-head painted white	655.09
Banner station, 0.1 mile southeast of, 60 feet south of road crossing, Chesapeake & Ohio Ry. stone bridge over Prater Creek, in top of south abutment at west end of parapet wall; chiseled square	648.67
Banner, in front of station; top of rail	653.6
Beaver Creek station, 1 mile southeast of, south side of railroad, in east end of cattle guard; top of bolt-head painted white	650.75
Beaver Creek station, 700 feet west of east abutment, top of south end of bridge seat of bridge over mouth of Beaver Creek; aluminum tablet stamped "638"	638.098

From Harold southwest along highway to Alliance.

Harold station, 0.7 mile west of, 0.2 mile south of mouth of Little Mud Creek, on west side of road, 25 feet northwest of center of road forks, opposite house, at foot of fence corner, in top of oak stake 2 inches square and 4 inches above ground; copper nail	646.12
Harold station, 1.5 miles southwest of, 80 feet southeast of George Aker's store, just north of mouth of Tollers Creek, northwest corner of road forks, 12 feet west of northeast corner of Aker's yard, in fence line, in root on road side of 6-inch butternut tree; copper nail	668.79
Harold station, 2.2 miles southwest of, 0.3 mile southeast of schoolhouse, 250 feet south of residence of Press Tackett, on east side of and 12 feet above road, in face of sandstone cliff; bronze tablet stamped "667"	666.914

Harold station, 3 miles southwest of, at south side of branch from east, in front of residence of Ida Clark (houses on both sides of road), east side of road, on top of rock; chiseled square	Feet 677.38
Harold station, 4.1 miles southwest of, 0.25 mile northeast of mouth of Parsons Branch, opposite end of low spur from west, at small branch from east, residence of Isaac Parsons stands on west side of road, east side of road, on north side and in bed of branch, on top of flat rock; chiseled square	680.30
Alliance, 0.25 mile southeast of, 60 feet south of road forks at mouth of Branhams Creek, east side of south road, on top of flat rock; chiseled square	681.18

From Drift north along highway to Alphoretta.

Alphoretta, 4.8 miles south of, at ford on Left Fork of Beaver Creek, 320 feet west of mouth of Hunters Branch, 200 feet east of house standing on south side of road, north bank of Beaver Creek, in root on north side of 2-foot walnut tree; copper nail	662.72
Alphoretta, 4.1 miles south of, 0.7 mile north of Hunters Branch, 350 feet south of Richard Salisbury's residence, 140 feet north of drain from west, 300 feet south of another drain from west, east end of low spur from northwest between drains, west side of road, in top of projection of rock cliff; aluminum tablet stamped "693"	693.121
Alphoretta, 3.3 miles south of, 100 feet west of mouth of Jake Akers Branch, at west end of loop in road and creek to west, east side of road, in front of large white house standing in mouth of branch from west, in base of telephone pole; copper nail	672.52
Alphoretta, 2.4 miles south of, 210 feet south of road forks, opposite mouth of Spurlock Branch, 25 feet south of southeast corner of Adam Halbert's yard, on west side of road, in root on road side of 2-foot elm tree; copper nail	662.43
Printer, 1.9 miles south of Alphoretta, 15 feet north of northeast corner of Jake Spurlock's store, west side of road, 80 feet south of branch from southwest, in root on west side of 10-inch apple tree; copper nail	663.35
Printer, 0.2 mile north of, 1.6 miles south of Alphoretta, 150 feet north of house standing in mouth of cove from west, 150 feet north of bend in road to north, west side of road, at foot of low spur from west, opposite blacksmith shop, on north side of entrance to coal opening, in face of sandstone rock; aluminum tablet stamped "689"	688.496

Alphoretta, 0.8 mile south of, at house in mouth of branch from west, 40 feet north of branch crossing on west side of road, at foot of east post of gate to field, on top of stone; chiseled square	Feet 645.73
Alphoretta, at road forks; top of stone in center	649.4
Alphoretta, 375 feet east of postoffice, west concrete abutment of steel highway bridge over Left Fork of Beaver Creek, in top of north end of parapet wall; chiseled square (on spur line)	651.04
Alphoretta, 0.5 mile north of, at store of T. J. Craft & Co., west concrete abutment of steel highway bridge over Right Fork of Beaver Creek, south end of concrete bridge seat, in top; aluminum tablet stamped "653"	652.451

From point near Buffalo station along Chesapeake & Ohio Ry. to East Point.

Buffalo station, 0.7 mile southwest of, road crossing at Concord schoolhouse, at southwest corner of crossing, in base of warning post; spike	625.83
Paintsville, 0.6 mile north of Chesapeake & Ohio Ry. station, east side of railroad, north side of road crossing, at foot of warning post; iron post stamped "616"	615.597
Paintsville, 210 feet south of Chesapeake & Ohio Ry. station, in top of northeast concrete foundation of steel pillar of water tank; chiseled square	619.36
Stafford station, in top of southeast corner of concrete curbing of platform; chiseled square	621.17
Stafford station, 1 mile southeast of, 0.22 mile north of Millers Creek platform, 60 feet west of track on west side of railroad right-of-way line, at road crossing; iron post stamped "620"	620.167
Millers Creek, 0.8 mile southwest of, at milepost "E 65 H 63" on east side of track, in north post of railroad stand at; spike	620.29
Lesley station (Flambeau postoffice), south side of track, in base of telegraph pole; spike	620.14
East Point, 0.9 mile northeast of, second pole east of milepost "E 63 H 65," in base of telegraph pole on south side of railroad; spike	622.22
East Point, in front of station; top of rail	625.4
East Point, in front of J. C. B. Auxier's store, at west end of south concrete abutment of driveway under railroad; iron post stamped "615"	614.796

Ore Knob southwest along highway to Jenkins, thence south to Pound Gap.

	Feet
Ore Knob, 1.8 miles west of, 80 feet east of roads forks at Pigeon Branch; nail in root of maple tree, marked "B. M. 1235"	1,234.90
Ore Knob, 2.9 miles west of, 400 feet east of Big Branch; chiseled square on large boulder, marked "B. M. 1259"	1,258.14
Ore Knob, 4.4 miles west of, 150 feet north of schoolhouse, in rock ledge; aluminum tablet stamped "1912 1296"	1,295.225
Shelby Gap, 0.5 mile east of, 150 feet south of road, on north bank of Elkhorn Creek; chiseled square, marked "U. S. B. M. 1347"	1,346.31
Jenkins, 5 miles east of, west end of Sandy Valley & Elkhorn Ry. bridge over Elkhorn Creek, north side of track; bolt painted white, marked "U. S. B. M. 1397"	1,395.93
Jenkins, 4 miles east of, south end of Sandy Valley & Elkhorn Ry. bridge over secondary road, in east abutment; aluminum tablet stamped "1409"	1,408.009
Jenkins, 3 miles east of, 750 feet west of No. 1 mine, south side of track; spike in telephone pole, marked "U. S. B. M. 1443"	1,442.92
Jenkins, 2 miles east of, at switch to mine No. 3, south side of track, spike in telephone pole, marked "U. S. B. M. 1476"	1,475.34
Jenkins, 0.5 mile east of, at brick kilns, north side of track; spike in telephone pole, marked "U. S. B. M. 1511"	1,510.13
Jenkins, southwest corner of main store, in cement walk; aluminum tablet stamped "1528"	1,527.321
Jenkins, 1 mile west of, at T road south to Pound, 5 feet west of house; chiseled mark on ledge, marked "U. S. B. M. 1828"	1,827.08

From point near Jenkins along highway west and north to Chip, thence southeast to Jenkins.

Jenkins, 2 miles west of, 150 feet east of store where road crosses Kentucky River, north side of road; chiseled square on ledge, marked "U. S. B. M. 1496"	1,495.75
Jenkins, 3 miles west of, 150 feet east of Sam Wright's house, opposite store, in ledge; aluminum tablet stamped "1391"	1,390.889
Jenkins, 4 miles west of, 100 feet south of road, 25 feet west of Kentucky River; nail in root of large beech tree, marked "U. S. B. M. 1298"	1,297.82
Jenkins, 5 miles west of, 200 feet east of house, 60 feet south of road, on south bank of Kentucky River; chiseled square on rock, marked "U. S. B. M. 1252"	1,251.88
Jenkins, 5.5 miles west of, 600 feet north of mouth of Boone Fork, west side of railroad culvert over creek; aluminum tablet stamped "1255"	1,254.222

	Feet
Boone Fork, at mouth of, 1 mile north of, west end of culvert over creek; chiseled square, marked "U. S. B. M. 1265"	1,264.39
Chip, 1 mile south of, 150 feet north of culvert over Boone Fork, 100 feet west of railroad grade; nail in root of sycamore tree, marked "U. S. B. M. 1274"	1,273.80
Chip, 0.2 mile north of, 10 feet east of road to McRoberts, in culvert; aluminum tablet stamped "1286"	1,284.994
Jenkins, 4 miles northwest of, 1 mile east of mouth of Potters Creek, 25 feet south of road, at foot of cliff; chiseled square, marked "U. S. B. M. 1316"	1,315.95
Jenkins, 2.5 miles northwest of, 300 feet east of Holcomb's store, 20 feet south of road, in boulder; aluminum tablet	1,390.883
Jenkins, 1.5 miles northwest of, 0.5 mile west of Potters Gap, south side of road; chiseled square on ledge, marked "U. S. B. M. 1507"	1,506.40
Jenkins, 1.5 miles north of, at tippie mine No. 6, 50 feet east of track; spike in telephone pole, marked "U. S. B. M. 1574"	1,573.34

From point 2 miles north of Shelby Gap south along Sandy Valley & Elkhorn Ry. to Shelby Gap.

Shelby Gap, 1.9 miles north of, 60 feet north of road crossing, just south of Reese Branch, south concrete abutment of Sandy Valley & Elkhorn Ry. bridge over Shelby Creek; chiseled square on east end of bridge seat, marked "1246.4"	1,246.36
Shelby Gap, 1.6 miles north of, at mouth of Vanover Branch, stone culvert under railroad; chiseled square on top of west end at north corner; marked "1273.5"	1,273.53
Shelby Gap, 0.9 mile north of, at mouth of Agee Branch, stone culvert under railroad; chiseled square on top of east end, marked "1323.4"	1,323.37
Shelby Gap, 0.2 mile southwest of, east concrete abutment of Sandy Valley & Elkhorn Ry. bridge over Elkhorn Creek, parapet wall; chiseled square on top of south end, marked "1392.0"	1,391.99

Near Kona Stations.

Kona, 350 feet west of station, 600 feet north of mouth of Boone Fork, in top of north side at east end of railroad culvert over creek; aluminum tablet stamped "1255"	1,254.222
Kona, 0.6 mile northwest of, on top of south abutment west parapet wall of railroad bridge over North Fork of Kentucky River; chiseled square, marked "1246.6"	1,246.63

From point near Oven Fork postoffice east along highways
to State line.

Oven Fork, 1.4 miles northeast of, 65 feet south of road summit, on west side of road crossing bridge between Meadow Branch and Poor Fork of Cumberland River, in root on road side of 2½-foot chestnut tree; copper nail stamped "2077.5"	Feet 2,077.19
Oven Fork, 1.9 miles northeast of, just north of Henry Mullin's residence, on south side of road, 70 feet east of top, at crossing of gap in spur, on top of rock outcrop; chiseled square, marked "2064.4"	2,064.04
Flat Gap, 1.4 miles southwest of, in center of road forks at mouth of Roberts Branch, 20 feet southeast of mail box, 50 feet southwest of ford, on top of flat rock; chiseled square, marked "2046.95"	2,046.63
Flat Gap, 1 mile west of, 30 feet west of State line, on south side of road, in front of Joseph Boling's barn, at road crossing State line between Kentucky and Virginia in Flat Gap, in top of sandstone outcrop; aluminum tablet stamped "2116"	2,116.101

From Praise (Elkhorn City) southwest along highway to
Ore Knob.

Praise (Elkhorn City), 100 feet west of station, in base of walnut tree; Carolina, Clinchfield & Ohio Ry. bench mark, marked "B. M. 794.18"	794.940
Praise, in west end of south abutment of railroad bridge over Russels Fork; aluminum tablet stamped "791, 1912"	790.972
Praise, 1.7 miles west of, 100 feet south of large branch to right, 4 feet above creek bed; chiseled square on rock ledge, marked "B. M. 810"	809.90
Praise, 3.2 miles west of, north of Elkhorn Creek, 5 feet above water; chiseled square on rock ledge, marked "B. M. 879"	878.74
Praise, 4.2 miles west of, 500 feet west of house at mill dam, north of road, in large boulder; aluminum tablet stamped "936, 1912"	935.380
Praise, 5.2 miles west of, 100 feet south of house south of road; top point of large boulder, marked "B. M. 966"	965.08
Praise, 6.4 miles west of, north of road; chiseled square on large boulder, marked "B. M. 1036"	1,035.64
Ashcamp, 150 feet east of, north of road, in large boulder; aluminum tablet stamped "1084, 1912"	1,083.583
Ashcamp, 1.9 miles west of, 3 feet south of road; chiseled square on large boulder, marked "B. M. 1109"	1,108.82

Ashcamp, 3.1 miles west of, 50 feet west of mouth of Sycamore Branch; nail in root of large birch tree, marked "B. M. 1151"	Feet 1,150.66
Ore Knob, 500 feet east of, south of road, in large boulder; aluminum tablet stamped "1188, 1912"	1,187.731
From Isaac Branch southwest along highway to Specht, thence northeast down Long Fork of Shelby Creek to Virgie, thence south up Shelby Creek to point 2 miles north of Shelby Gap.	
Kite, 4.6 miles southeast of, southeast of mouth of Mud Lick Fork, at fence corner; chiseled square on top of rock, marked "1128.8"	1,128.70
Kite, 5.8 miles southeast of, 250 feet northeast of mouth of Stover Branch, at fourth-class road leading up Stover Branch to triangulation station at county corners, 220 feet north of house owned by W. J. Hall's heirs and occupied by Ephraim Little, north side of Beaver Creek, in face of rock ledge; aluminum tablet stamped "1297"	1,297.225
Kite, 6.4 miles southeast of, 1.7 miles northwest of Specht, west side of trail through gap between Right Fork of Beaver Creek and Long Fork of Shelby Creek at county line between Pike and Knott counties, 15 feet south of center of gap; copper nail without washer in east side of 2-inch white oak tree, marked "1827.8"	1,827.74
Specht, 1.2 miles northwest of, at head of Long Fork of Shelby Creek, at foot of south side of divide between Right Fork of Beaver Creek and Long Fork of Shelby Creek, at top of bank on east side of creek at forks, 70 feet south of house and in yard; nail in root of east side of 2-foot beech tree, marked "1431.0"	1,430.96
Specht, 0.4 mile southwest of, at mouth of Rockhouse Branch, east side of road to north, north side of forks of road, 200 feet southeast of house standing in northwest corner of road forks; chiseled square on top of stone, marked "1233.8"	1,233.79
Specht, at mouth of Yonts Branch, southeast corner of road forks, 70 feet southeast of Silas Johnson's store (Specht postoffice), in top of projection of rock ledge; aluminum tablet stamped "1207"	1,206.842
Specht, 0.9 mile northeast of, on west side of road and east bank of creek, 180 feet east of residence of Monroe Johnson, 120 feet east of mouth of Big Branch; copper nail without washer in root of 15-inch walnut tree, marked "1112.3"	1,112.23
Specht, 1.5 miles northeast of, opposite and 100 feet west of mouth of Bull Hollow, 50 feet north of creek, 60 feet west of house owned by W. B. Johnson, inside of fence line; chiseled square in top of projection at foot of rock ledge, marked "1072.1"	1,072.02

Specht, 2.5 miles northeast of, 1.2 miles north of Etty, at southwest corner of forks of Long Fork of Shelby Creek, 350 feet south of forks of creek, in face of stone pillar of foundation at northeast corner of public schoolhouse; aluminum tablet stamped "1019"	Feet 1,018.831
Hartley, 0.3 mile west of, northeast corner of creek intersection, 12 feet east of fence corner, southeast fence corner of yard of Alec Johnson's residence, at mouth of Marshals Branch; nail in trunk of 1-foot sycamore tree, marked "985.5"	985.50
Hartley, 0.6 mile northeast of, in front of James Tackett's residence, 50 feet north of mouth of Abel Tacketts Branch, 30 feet north of ford, on west bank of Long Fork, on south side of 14-inch sycamore tree; chiseled square on top of embedded small stone, marked "958.2"	958.12
Hartley, 1.7 miles northeast of, 4.8 miles southwest of Virgie, at end of low spur of ridge from northwest, on west side of Long Fork, 800 feet northeast of mouth of Buck Tackett's Branch, 760 feet northeast of residence of Neal Little, 400 feet southwest of Newsome Branch, in top of projection of rock ledge; aluminum tablet stamped "930"	929.518
Virgie, 3.8 miles southwest of, 130 feet west of bend in creek to north, 125 feet east of residence of Caleb Hampton, 25 feet southwest of storehouse, on north bank of Long Fork, south side of road; copper nail in root on creek side of 2½-foot elm tree, marked "900.3"	900.32
Virgie, 3.1 miles southwest of, 80 feet north of schoolhouse on west bank of Long Fork, at bend in creek to east; nails in root on south side of 14-inch sycamore tree, marked "884.5"	884.43
Virgie, 1.9 miles southwest of, on west bank of Long Fork, 120 feet north of mouth of Hunts Branch and Grant Tackett's residence; chiseled square on top of large rock, marked "853.3"	853.30
Virgie, 0.7 mile west of, 120 feet east of mouth of Indian Creek, in front of Marion Tackett's residence, north side of Long Fork, south side of road; nails in root on north side of 2½-foot elm tree, marked "825.1"	825.09
Virgie, Sandy Valley & Elkhorn Ry. bridge over Shelby Creek and highway, in top of west end of bridge seat of north concrete abutment; aluminum tablet stamped "837"	836.635
Virgie, 1.2 miles south of, on north side of private road crossing; spike in base of second fence post west of track, marked "868.5"	868.49
Virgie, 1.6 miles south of, 300 feet south of road crossing, Chesapeake & Ohio Ry. bridge over Shelby Creek near mouth of Ellzick Branch, on top of north abutment east end of parapet wall; chiseled square, marked "877.9"	877.94

Virgie, 2.5 miles south of, at mouth of Ben Hall Branch from west, at bend in creek and road to southeast, on top at east end and south corner of stone culvert; chiseled square, marked "891.9"	Feet 891.86
Virgie, 3.7 miles south of, 0.5 mile north of Burks Branch, at mouth of small branch from west, in front of residence of Stephen Osborne, in top of north concrete abutment at west end of bridge seat of Sandy Valley & Elkhorn Ry. bridge over Shelby Creek and highway; aluminum tablet stamped "933"	932.771
Burks Branch, 100 feet south of crossing, west side of railroad track; spike in base of telegraph pole, marked "945.9" (By single unchecked sight)	945.94
Myra, 0.6 mile north of, at first bend in creek to south, at small drain from north; nails in top at north end of plank culvert under railroad, marked "960.4"	960.41
Myra, 0.5 mile north of, at rear of residence of Elizabeth Greer, stone culvert under railroad; chiseled square on top of west end, marked "956.9"	956.88
Myra, at east end of footbridge over Shelby Creek, opposite postoffice, in top of post on south side; nail, marked "968.3"	968.29
Myra, on east side of railroad, 50 feet south of east end of footbridge, 160 feet north of mouth of Beef Hide Creek; chiseled square on top of projection of rock, marked "977.3"	977.25
Myra, 0.4 mile south of, Sandy Valley & Elkhorn Ry. bridge over Cane Branch, parapet wall of south concrete abutment; chiseled square on top of west end, marked "986.3"	986.26
Dorton, railroad bridge over mouth of Dorton Creek, in top of north abutment west end of bridge seat; aluminum tablet stamped "1017"	1,017.312
Dorton, 0.6 mile south of, 60 feet north of house standing on east side of track, at mouth of small branch from east, stone culvert under railroad; chiseled square on top of west end of north corner, marked "1044.3"	1,044.29
Dorton, 1.2 miles south of, Sandy Valley & Elkhorn Ry. bridge over mouth of Owl Creek, parapet wall of north concrete abutment; chiseled square on top of west end, marked "1098.2"	1,098.16
Dorton, 2.2 miles south of, Sandy Valley & Elkhorn Ry. bridge over Shelby Creek at mouth of Threemile Creek, bridge seat at north concrete abutment, in top of west end; aluminum tablet stamped "1168"	1,168.131

From Virgie northeast along Baltimore & Ohio R. R. to
Pikeville and Coal Run.

	Feet
Virgie, Baltimore & Ohio R. R. bridge over Shelby Creek and highway, top of west end of bridge seat, north concrete abutment; aluminum tablet stamped "837".....	836.635
Virgie, 0.5 mile north of station, Baltimore & Ohio R. R. bridge over Shelby Creek, 50 feet south of road crossing, top of east end of parapet wall of north concrete abutment; chiseled square	824.84
Virgie, 1.8 miles northeast of, 40 feet south of road crossing, Baltimore & Ohio R. R. bridge over Shelby Creek, in top of west end of parapet wall of north concrete abutment; chiseled square	802.76
Penny, in front of station; top of rail	793.4
Penny station, 0.2 mile north of, 400 feet southwest of mouth of Caney Creek, 260 feet north of milepost 8, top of west end of small concrete culvert under Baltimore & Ohio R. R.; aluminum tablet stamped "783" ..	783.027
Penny station, 1.2 miles northeast of, 70 feet south of milepost 7, 0.2 mile south of bend in railroad and creek to east in top of east end of stone culvert under Baltimore & Ohio R. R., at southeast corner; chiseled square	774.72
Penny station, 1.9 miles northeast of, 30 feet north of road crossing, Baltimore & Ohio R. R. bridge over Shelby Creek, in top of west end of parapet wall of south abutment; chiseled square	768.35
Penny station, 2.5 miles northeast of, in top of east end of concrete center pier of Baltimore & Ohio R. R. bridge over mouth of Robinson Creek and highway; aluminum tablet stamped "755"	754.901
Yeager station, 0.8 mile southwest of, 70 feet south of Riddle farm residence, 300 feet north of milepost 15, top of west end of iron culvert under railroad, at mouth of small branch from northwest; painted square	748.10
Yeager, in front of station; top of rail ..	733.7
Yeager, 470 feet north of station, at mouth of Little Creek, on north abutment top of west end of parapet wall of Baltimore & Ohio R. R. bridge over Shelby Creek; chiseled square	730.70
Yeager station, 0.8 mile northeast of, 300 feet north of road crossing and residence of H. E. Yates, south abutment top of east end of parapet wall of Baltimore & Ohio R. R. bridge over Shelby Creek; aluminum tablet stamped "714"	713.886
Yeager station, 1.8 miles northeast of, 550 feet north of road crossing, in top of west end of parapet wall of south abutment of Baltimore & Ohio R. R. bridge over Shelby Creek; chiseled square	706.84

	Feet
Shelby station, 1.6 miles southwest of, west side of track, in point in base of milepost 1, on track side of fence; staple ..	701.32
Shelby station, 0.6 mile northwest of, 475 feet west of junction of Baltimore & Ohio R. R. and Chesapeake & Ohio Ry., east stone abutment, in top of south end of parapet wall of Chesapeake & Ohio Ry. bridge over mouth of Shelby Creek; bronze tablet stamped "698, 1913" .. .	697.863
Fords Branch, at south end of station platform; top of rail...	693.2
Fords Branch station, 150 feet north of station signboard, in southeast corner of cattle guard; bolt-head painted white....	692.38
Fords Branch station, 1.3 miles northeast of, 30 feet east of milepost H 110 E 18, on top of south end of concrete culvert under railroad; chiseled square	689.10
Kewanee station, 140 feet east of platform, south end of concrete culvert under railroad, in top of; bronze tablet stamped "686"	685.977
Kewanee station, 0.8 mile northwest of, mouth of Marions Branch, in northeast corner of cattle guard; top of bolt-head painted white	686.50
Kewanee station, 1.6 miles northwest of, 400 feet north of milepost H 108 E. 20, 150 feet north of house on west side of track, in northwest corner of cattle guard; top of bolt-head painted white	686.21
Island Creek, 340 feet north of station, in top of south abutment of east end of stone bridge seat of Chesapeake & Ohio Ry. bridge over mouth of Island Creek; bronze tablet stamped "679"	679.358
Island Creek station, 0.9 mile northeast of, 225 feet north of milepost H 106 E 22, 200 feet south of center one of three houses on west side of railroad, on top of east end of concrete culvert under railroad; chiseled square .. .	677.98
Pikeville, at top of southwest corner of concrete curbing around station platform; chiseled square	680.03
Pikeville, northwest corner of yard to Pike County courthouse; top of cap, on letter "B" (U. S. Corps of Engineers b. m.)	683.37
Pikeville, northwest corner of courthouse yard; top of pin at bottom inside of B. M. 44 (Army engineers' elevation not obtained)	681.38
Pikeville, northeast corner of Pike County courthouse, in north face of stone foundation, first stone under water table; bronze tablet stamped "685 Ky"	685.220
Pikeville, 0.8 mile northwest of, 90 feet east of railroad turntable, in top of north end of concrete culvert under railroad; chiseled square	674.95
Pikeville, 1.7 miles northwest of, 70 feet north of Cedar Creek, east end of railroad cut, southwest corner of cattle guard, in top of post level with ground; copper nail.....	678.21

Pikeville, 2.8 miles northwest of, 120 feet south of branch from west, west side of track, 270 feet south of house standing on east side of track, in cattle guard; center bolthead painted white 677.69

From Alliance south along highway to Beaver, thence southwest and west to Fed, thence north to Drift.

Alliance, 0.4 mile south of, 800 feet southwest of road forks, at mouth of Branhams Creek, 7 feet above and on west side of road, in face of sandstone rock; aluminum tablet stamped "726" 725.711

Alliance, 1 mile southwest of, 0.7 mile southwest of road forks, at mouth of Branhams Creek, opposite and 100 feet north of residence of Jerry Swoard standing on east side of road, 300 feet south of branch from west, on west side of road, at small drain crossing, in root on east side of 2-foot sycamore tree (called "sixmile tree"); copper nail..... 694.30

Craynor, 650 feet north of postoffice, 350 feet north of M. Tackett's store, 80 feet south of point where S. Frazier's branch crosses road, on west side of road, in root on north side of 3-foot walnut tree; copper nail 701.61

Craynor, 1 mile south of, 250 feet east of mouth of Will Hamilton's branch, on south side of road, in root on north side of 3-foot sycamore tree; copper nail 713.92

Craynor, 1.6 miles south of, 0.6 mile south of Will Hamilton's branch, 300 feet west of bend in creek to west, 500 feet west of mouth of Rod Aker's branch and residence of Robert Hamilton, 150 feet east of bend in creek to south, on north bank of creek, 20 feet from water's edge, in large sandstone rock; bronze tablet stamped "736 Ky"..... 735.757

Craynor, 2.5 miles south of, at northwest corner of road forks, at mouth of Noah Newson's branch, end of spur from northwest, on north side of and 2 feet above road to west; on top of projecting sandstone rock; chiseled square 767.73

Craynor, 3.2 miles south of, mouth of Dry Branch, 60 feet east of mouth on north side of road, in root on south side of 2-foot sycamore tree; copper nail 790.81

Craynor, 4.1 miles south of, 770 feet north of mouth of Howell Branch, 300 feet south of residence of Jonah Isaacs standing on west side of road, on west bank of Mud Creek, in top of large sandstone rock; aluminum tablet stamped "825" 824.451

Beaver, 0.25 mile west by 1.2 miles north of, at mouth of Mitchell Fork at store of A. J. Hamilton, Jr., in front of house standing on west side of road, in root on west side of 2-foot beech tree; copper nail..... 885.18

Beaver, 0.25 mile west of, 270 feet southwest of road forks, at mouth of Tackett Branch, on north bank of Mud Creek, in front face of corner foundation stone at southeast corner of M. E. Church; bronze tablet stamped "976"..... 976.005

Beaver, 1.2 miles west of, mouth of Tim Hinson's branch, north side of Mud Creek, west side of branch, at third-class road leading northwest to head of Fraziers Creek, 15 feet south of fence corner, in base on west side of 5-inch walnut tree; copper nail 1,060.88

Beaver, 1.9 miles southwest of, 50 feet north of mouth of Harmon More Fork (last forks of Mud Creek), north side of creek, on top of projecting rock in cliff, about 1.5 feet above bed of creek; chiseled square 1,155.29

Fed, 3.6 miles east of, 550 feet northwest of schoolhouse, 450 feet northwest of branch from southeast, 0.25 mile south of Joseph Henson's residence, 60 feet north of mill and dam, on east bank of Clear Creek, 4.5 feet above water level, in face of rock cliff; aluminum tablet stamped "1112" 1,111.429

Fed, 2.7 miles east of, at mouth of Reynolds Branch, 170 feet west of Jim Reynolds' store, on north bank of Clear Creek, opposite mouth of branch, on top of rock cliff; chiseled square 1,018.76

Fed, 1.9 miles east of, 60 feet east of mouth, south bank of Clear Creek, north side of road to south, at mouth of Osborne Branch, at road forks, in root on west side of 1-foot sycamore tree; copper nail 947.89

Fed, 1.25 miles east of, 180 feet east of mouth of John Reynolds Branch, north bank of Clear Creek, in root on south side of 2-foot sycamore tree; copper nail 899.75

Fed, mouth of Clear Creek, north side of Clear Creek, east side of left fork of Beaver Creek, 30 feet above bed of creek, in point of spur from east, in face of sandstone outcrop; bronze tablet stamped "837" 837.256

Fed, 1.1 miles north of, 340 feet north of mouth of Aise Justice Branch, 100 feet north of Ben Martin's store, on west side of road, in root on south side of 8-inch poplar tree; copper nail 777.58

Fed, 1.9 miles north of, at mouth of small drain from east, at splash dam, east end of loop in creek to east, large white house known as "The Company Club House" on east bank of left fork of Beaver Creek, north side of road and branch from east, on southwest corner of concrete well curbing in front yard; chiseled square 783.48

Fed, 3.5 miles north of, 285 feet north of mouth of branch from east, east end of loop in creek to east, 0.3 mile southeast of McCurry Branch, west side of creek, at fence corner, 3 feet east of fence, in root on west side of 6-inch sumac tree; copper nail 738.70

Fed, 3.8 miles north of, 60 feet south of mouth of McCurry Branch, west side of road and creek, inside of fence, in root on north side of 2-foot elm tree; copper nail.	Feet 735.33
Fed, 3.8 miles north of, 250 feet west of mouth of McCurry Branch, on north side of McCurry Branch, at rear of house, end of low spur from northwest, 25 feet above branch, in face of sandstone rock outcrop; aluminum tablet stamped "766"	765.666
McDowell, 3.2 miles south of, 100 feet west of mouth of John Moore Branch, 20 feet east of bend in road to south, on south side of road and branch, in foot of telephone pole; copper nail	728.07
McDowell, 2.5 miles south of, 60 feet south of road forks, 60 feet west of store, east bank of Beaver Creek at mouth of Spewing Camp Branch, south side of branch, at corner of picket fence, on top of rock; chiseled square	716.28
McDowell, 1.8 miles south of, opposite small branch from east, east end of loop in creek to east, opposite and 50 feet south of log house, west side of Beaver Creek and road at fence line, in root on creek side of 2-foot elm tree used as corner fence post; copper nail	703.30
McDowell, 0.6 mile southwest of, 100 feet north of bend in road and creek to east, on east side of road at fence line; in front on north side of 2.5-foot elm tree; copper nail	697.84
McDowell, mouth of Fraziers Creek, northeast corner of road forks, 20 feet south of southeast corner of Millford Hall's store, 20 feet north of southeast corner of store lot at east lot line, in top of sandstone rock 2.5 feet long and 5 inches square at top, set in ground with top 4 inches above ground; bronze tablet stamped "705 1913"	701.539
McDowell, 1 mile northwest of, 835 feet north of residence of Preston Hall, 210 feet north of branch from east, at east end of loop in creek to east, on north bank of small drain from east, east bank of Beaver Creek, west side of road, in root on south side of 14-inch elm tree; copper nail	695.76
Minnie, 0.5 mile east of, road forks opposite mouth of sycamore Branch, 75 feet east of William Stumbo & Son's store, 30 feet north of barn, front of coal shed, southwest corner of road forks at drain crossing, on edge of west wagon track, on top of sandstone; chiseled square	696.51
Minnie, 0.5 mile east by 0.9 mile northeast of, at mouth of Simpson and Martin Branch, east side of road, north side of branch, at foot of low spur from northeast, below church and schoolhouse, 40 feet east of road crossing branch, in face of rock cliff, 2.5 feet above bed of branch; aluminum tablet stamped "688 1913"	687.597

Minnie, 0.5 mile east by 1.4 miles northeast of, southeast corner of wooden highway bridge over Frozen Creek, top of south end of log; copper nail	Feet 689.03
Drift, 0.5 mile east by 0.2 mile south of, 50 feet north by 30 feet west of stream, 10 feet west of west fence line, 60 feet north of fence corner, at road crossing Joel Martin Branch from east, in root on road side of 1-foot elm tree; copper nail	678.30
Drift, 0.5 mile east by 0.3 mile northeast of, 180 feet east of small branch from southeast, 300 feet west of bend in creek to north, north side of road, in front of house standing on south side of road, south side of creek, opposite and 100 feet east of house standing on north side of creek; in root on south side of 3-foot elm tree; copper nail	670.86
From point near Blackey station northwest along Lexington & Eastern Ry. to Hazard.	
Blackey station, 1.8 miles northwest of, road crossing at mouth of Caudill's Branch, 40 feet west of branch, east side of road, north side of track, in base of telegraph pole; spike marked "980.3"	779.95
Blackey station, 2.9 miles northwest of, 470 feet west of Gourd postoffice, in top of east stone abutment at north end of bridge over North Fork of Kentucky River; aluminum tablet stamped "972"	971.974
Ulvah station, 1.9 miles southeast of, at mouth of branch from north at residence of John Back, 0.2 mile west of bend in river to west, on top of south end of stone culvert under railroad; chiseled square, marked "970.2"	969.83
Ulvah station, 0.7 mile southeast of, at mouth of small drain from north, in front of and 100 feet east of residence of Widow Lusk, top of south end of stone culvert under railroad; chiseled square marked "963.9"	963.55
Ulvah, north side of track, northeast pier of stone foundation of railroad water tank, in top of second stone from top; aluminum tablet stamped "962"	961.742
Ulvah station, 0.8 mile west of, opposite and 200 feet east of branch from south, on south side of railroad, on top of stone culvert; chiseled square marked "956.1"	955.76
Ulvah station, 1.5 miles northwest of, at east end of railroad cut through spur, near mouth of Bull Run, on east abutment south end of parapet wall of bridge over North Fork of Kentucky River; chiseled square marked "953.9"	953.50
Cornettsville, in front of station; top of rail	953.6

Cornettsville, 0.6 mile west of, opposite mouth of Leatherwood Creek, 50 feet east by 80 feet north of east end of railroad cut, 80 feet north of railroad on east bank of small drain from north, in rock outcrop; aluminum tablet stamped "961"	Feet 960.572
Cornettsville, 1.7 miles northwest of, opposite and 150 feet south of mouth of Campbell Branch, 110 feet north of milepost Lex. 154, on top of east end of stone culvert under railroad; chiseled square marked "944.2"	943.78
Cornettsville, 2.8 miles northwest of, 550 feet north of milepost Lex. 153, on top of east end of stone culvert under railroad; chiseled square marked "935.1"	934.66
Hombre station, 1.2 miles south of, at mouth of Fort Branch, north end, west side of railroad trestle over Fort Branch, in top of guard rail; bolthead painted white, marked "933.0"	932.59
Hombre station, 150 feet south by 75 feet east of station, 200 feet north of Big Branch, in barn yard of, in rear of Richard McIntire's store (Fort Branch postoffice), 10 feet south of southeast corner of store, 5 feet south by 15 feet west of northwest corner of barn, in rock ledge; aluminum tablet stamped "923 1913"	922.290
Hombre station, 1 mile northwest of, 200 feet east of curve to northwest, at east end of cut, 0.3 mile east of milepost Lex. 150, north end of stone culvert under railroad, on top; chiseled square marked "918.0"	917.62
Hombre station, 2.1 miles northwest of, at mouth of Hurricane Branch, at east end of stone culvert under railroad, in top; chiseled square marked "910.2"	909.85
Masu station, 1.8 miles east of, 100 feet west of Felix Bra-shear's residence, just east of bend in river to south, south end of stone culvert under railroad; chiseled square marked "910.9"	910.60
Masu station, 0.6 mile east of, west abutment top of north end of parapet wall of railroad bridge over North Fork of Kentucky River; aluminum tablet stamped "908 1913"	907.560
Masu station, in front of station; top of rail	905.4
Masu station, 500 feet west of, in top of west abutment north end of railroad bridge over mouth of Macies Creek; chiseled square marked "897.52"	897.16
Masu station, 0.5 mile northwest of, north end of guard rail on east side of trestle bridge over mouth of Elk Branch, top of bolthead painted white, marked "905.8"	905.43
Masu station, 1.4 miles northwest of, at mouth of small drain from northwest at bend in river and railroad to east, on top of west end of stone culvert under railroad; chiseled square marked "894.9"	894.51

Hamdin station, 0.3 mile south of, about 700 feet north of mouth of Carr Fork, railroad bridge over North Fork of Kentucky River, on top of east abutment at south end; aluminum tablet stamped "890"	Feet 889.868
Hamdin station, in front of station; top of rail	897.1
Hamdin station, 0.3 mile north of, 220 feet south of Jeff post-office, north end of guard rail, west side of railroad, on trestle bridge over mouth of Buckeye Creek; top of bolt-head painted white, marked "895.8"	895.31
Hamdin station, 1.3 miles northwest of, in front of two houses standing on north side of track, in top of north end of stone culvert under railroad at drain from northeast; chiseled square marked "884.1"	883.60
Edjouet station, in front of; top of rail	885.9
Edjouet station, 0.5 mile north of, 75 feet south of mouth of Raccoon Branch, 100 feet east of railroad, east side of road, in rock cliff; aluminum tablet stamped "879"	878.099
Edjouet station, 1.4 miles northwest of, 400 feet north of mouth of Buffalo Branch, 200 feet east by 330 feet south of house standing on river bank, west side of track, 430 feet south of third-class road crossing, on top of west end of stone culvert under railroad; chiseled square marked "879.1"	878.63
Hazard, 1.5 miles southeast of, at mouth of Gergor Branch, top of east end of stone culvert under railroad; chiseled square marked "866.5"	866.02
Hazard, 0.5 mile southeast of, on south abutment east end of parapet wall of south approach to railroad bridge over North Fork of Kentucky River, on top of east end of tunnel; chiseled square marked "877.0"	876.44
Hazard, in front of Lexington & Eastern Ry. station; top of rail	867.4
Hazard, First National Bank building, in face of water table north side of entrance; aluminum tablet stamped "873"	873.280
From Ulvah station south along highways to mouth of Will-son Branch on Defeated Creek, thence west to Cutshin Creek near Kate postoffice, thence north to Mason station.	
Ulvah station, 1.4 miles south of, on north side of Line Fork, at mouth of small drain from north, in front of William Lusk's store, in top of flat rock; chiseled square marked "954.1"	953.77
Ulvah station, 2.3 miles southeast of, bend in Line Fork to east, 300 feet northwest of mouth of branch from south, north side of creek, at fence corner, in root on creek side of 2-foot sycamore tree; copper nail marked "971.5"	971.15

Ulvah station, 3.3 miles southeast of, east bank of creek, at mouth of Cliff Branch on south side, on top of stone between roots of 2½-foot sycamore tree; chiseled square marked "978.6"	Feet 978.22
Ulvah station, 3.8 miles southeast of, 20 feet south of apple tree, east side of road, at mouth of Campbell Branch on south side, 5 feet north of gate, on top of rock; chiseled square marked "993.0"	992.58
Ulvah station, 4 miles southeast of, at west side of road, east bank of creek, opposite mouth of Long Branch, in root on roadside of 14-inch birch tree; tenpenny nail marked "991.6"	991.22
Banks, 1.6 miles northeast of, 170 feet south of mouth of Turkey Creek, on east bank of Line Fork, at point of spur from southeast, 90 feet south of 2½-foot sycamore tree, in rock cliff; aluminum tablet stamped "1012".....	1,011.639
Banks, 0.8 mile northeast of, at bend in creek to southwest, west side of creek, opposite mouth of Pigeon Fork, in root on west side of 14-inch sycamore tree; copper nail marked "1044.6"	1,044.26
Banks, on west side of Turkey Creek, 30 feet south of mouth of Bates Fork, in front of postoffice, on top of rock; chiseled square marked "1080.5" ..	1,080.08
Banks, 0.5 mile south of, trail to southeast 100 feet south of mouth of Owens Cabin Branch, east bank of creek, west side of road at spring, on top of flat rock; chiseled square marked "1107.1"	1,106.74
Banks, 1.4 miles south of, 70 feet south of mouth of Eastern Branch, on east bank of creek, opposite large rock and 2 chestnut trees, in top of large sandstone rock; chiseled square marked "1162.3"	1,161.86
Banks, 2.1 miles south of, at west side of creek, 75 feet south of mouth of Deaden Branch, at foot of fence corner, in front of Mr. Smith's residence, in bed of creek, on top of flat rock; chiseled square marked "1218.3" ..	1,217.95
Banks, 2.6 miles south of, trail leading south to head of Defeated Creek, 100 feet west and 40 feet north of mouth of branch and trail to south, inside of fence line, in top of large sandstone rock; aluminum tablet stamped "1266".....	1,265.496
Banks, 2.6 miles southwest by 0.4 mile south of, on bench on north side of divide between Turkey and Defeated Creeks at bend in trail to southwest, on west side of trail, in root on north side of 15-inch maple tree; copper nail marked "1798.9"	1,798.46
Banks, 3.4 miles southwest of, at top of divide between Turkey Creek and Willson Branch of Defeated Creek, east side of trail, in root on east side of 2.5-foot oak tree; copper nail marked "2023.4"	2,023.03

Defeated Creek, 3.8 miles southwest by 0.6 mile north of, at forks of Willson Creek, at foot of south side of divide between Turkey and Defeated Creeks, 150 feet northeast of forks, east side of trail, north bank of branch, 2 feet above water, on top of stone bedded in roots on south side of 14-inch gum tree; chiseled square marked "1637.8".....	Feet 1,637.43
Defeated Creek, 3.8 miles southwest of, east side of Willson Branch, 60 feet north of mouth in root on east side of 2-foot sycamore tree; copper nail marked "1421.2".....	1,420.80
Defeated Creek, 4.2 miles southwest of, road forks 50 feet west of mouth of Trace Branch, road leading south to Trace Fork of Line Fork, on south side of bed of Defeated Creek, at northeast edge of clump of pine trees, in top of large sandstone rock; aluminum tablet stamped "1481".....	1,480.575
Defeated Creek, 5 miles southwest of, 30 feet south of forks at head of Defeated Creek, trail leading southwest to head of Jackson Branch of Big Leatherwood Creek, west bank of south fork at end of spur from west at water's edge, in root on south side of 1-foot chestnut tree; copper nail marked "1704.3"	1,703.88
Delphia, 4.7 miles east of, at top of divide between Defeated Creek and Jacksons Fork of Big Leatherwood Creek, at Perry-Letcher county line, 20 feet east of center of ridge, 20 feet south of trail, in root on west side of 3-foot chestnut tree; copper nail marked "2340.7"	2,340.28
Delphia, 4 miles east of, at head of Jackson's Fork, at foot of west side of divide between Defeated Creek and Big Leatherwood Creek, 250 feet north of forks, 250 feet southeast of house, 130 feet east of trail crossing creek, 75 feet west of two large rocks, on south side of trail, in root on south side of 15-inch lone pine tree; copper nail marked "1744.3" ..	1,743.91
Delphia, 3.7 miles east of, at mouth of Jacksons Fork, at bend in Big Leatherwood Creek to south, 35 feet west of forks of trail, 30 feet south of trail crossing branch, 50 feet south of log barn, south bank of Jacksons Fork and north side of trail, in top of large sandstone rock; chiseled square marked "1617.3"	1,616.86
Delphia, 2.4 miles northeast of, 200 feet west of mouth of Bark Camp Branch, on north bank of Leatherwood Creek, in top of large sandstone rock at water's edge; aluminum tablet stamped "1423"	1,423.029
Delphia, 1.5 miles northeast of, 110 feet south of mouth of Beech Rock Branch, 170 feet south of bend in creek to west, in front of stable, in center of road, top of rock, chiseled square marked "1341.6" ..	1,341.120
Delphia, 0.5 mile northeast of, in mouth of branch from east, opposite residence of Andy Shepherd, on west side of top of large sandstone rock; chiseled square marked "1209.5".....	1,209.02

	Feet
Delphia, west side of mouth of Stony Fork, in front of post-office, at north end on west side of log breakwater, at south post of gate to store, in top of lower log; copper nail marked "1165.5"	1,165.05
Delphia, 0.8 mile northwest of, 800 feet southeast of mouth of Lynn Fork, 175 feet south of house, 15 feet east of road, 15 feet north of ford, top of gray flat rock; chiseled square marked "1119.8"	1,119.37
Delphia, 1.5 miles northwest of, 350 feet south of mouth of Clover Fork, 40 feet south of residence of William Asher, on east bank of Leatherwood Creek, under small elm and gum trees at water's edge, on top of sandstone rock; aluminum tablet stamped "1088" ..	1,087.733
Delphia, 1.5 miles northwest by 0.8 mile west of, at forks of Clover Fork, on south bank of Left Fork, 60 feet southwest of center of forks, 10 feet east of small sycamore tree, 4 feet north of fence line, 5 feet northeast of east post of gate, on top of flat rock; chiseled square marked "1141.3" ..	1,140.81
Delphia, 1.5 miles northwest by 2 miles west of, at mouth of Saddle Fork on Clover Fork, top of rock; chiseled square marked "1308.3" ..	1,307.83
Delphia, 1.5 miles northwest by 2.5 miles west of, 20 feet north of mouth of Bee Tree Fork, west bank of Clover Fork, on top of rock; chiseled square marked "1400.8"	1,400.37
Delphia, 1.5 miles northwest by 3.6 miles southwest of, at head of Clover Fork, opposite mouth of Lick Fork, west side of trail running under cliff (known as the Old Rock-house), 0.6 mile east of Low Gap between Clover Fork and Low Gap Branch of Cutshin Creek, 10 feet south of north cliff, 2.5 feet above trail, set vertically in face of rock wall; aluminum tablet stamped "1605" ..	1,605.046
Delphia, 1.5 miles northwest by 4.2 miles southwest of, at top of divide between Clover Fork and Low Gap Branch of Cutshin Creek, north side of trail, on Perry-Leslie county line, on top of flat rock; chiseled square marked "1755.55" ..	1,755.09
Kate, 2 miles north by 1.25 miles southeast of, on Low Gap Branch of Cutshin Creek, 25 feet north of mouth of small branch from east, east side of bend in trail and creek to south, on top of large flat rock; chiseled square marked "1603.4" ..	1,602.89
Kate, 2 miles north of, 220 feet north of house, 215 feet south of road forks, opposite mouth of Low Gap Branch, west side of and 3 feet above road, at northeast corner of large sandstone rock; aluminum tablet set vertically, stamped "1412" ..	1,411.794

	Feet
Kate, 2.5 miles north of, at mouth of Guthrie Branch, on east side of Cutshin Creek, south side of branch, in trail on top of rock; chiseled square marked "1324.5" ..	1,324.07
Kate, 3.3 miles north of, on north bank of creek, south side of road at west end of log wing dam, in front of gate to house at ford, opposite mouth of Roan Branch, on top of rock; chiseled square marked "1237.8" ..	1,237.36
Kate, 3.9 miles north of, 500 feet northwest of mouth of Laurel Branch, 30 feet north of ford, on east side of and 5 feet above road, on top of rock; chiseled square marked "1177" ..	1,176.52
Kate, 4.6 miles north of, 3 miles southeast of Cutshin post-office, on east bank, 200 feet northeast of mouth of Trace Branch, 150 feet south of Felix Lewis's residence, at water's edge, in top of large sandstone rock; aluminum tablet stamped "1107" ..	1,106.466
Kate, 5.7 miles north of, 30 feet south of mouth and on south bank of Narrow Branch, on Trace Branch of Cutshin Creek, 100 feet southeast of schoolhouse, in root on south side of 2-foot poplar tree; copper nail marked "1198.5" ..	1,198.04
Kate, 6.6 miles north of, 15 feet west of mouth and on north bank of Rock Creek, on Trace Fork of Cutshin Creek, on top of rock; chiseled square marked "1255.3" ..	1,254.82
Farler, 5.2 miles south of, 30 feet southeast of intersection on south side of Trace Branch, at mouth of Lick Fork of Trace Branch of Cutshin Creek, at foot of fence, in top of rock; chiseled square marked "1267.35" ..	1,266.86
Farler, 5.2 miles south of, 300 feet north of mouth of Lick Fork (Cuddy Branch) of Trace Branch of Cutshin Creek, on east side of road, in top of rock ledge; aluminum tablet stamped "1270" ..	1,269.220
Farler, 4.8 miles south of, at forks of Lick Fork (Cuddy Branch) of Trace Branch of Cutshin Creek, 150 feet northwest of intersection of forks, in root on west side of 1-foot walnut tree; copper nail marked "1289.8" ..	1,289.27
Farler, 4 miles south of, 30 feet north of top of divide between Right Fork of Macies Creek and Lick Fork of Trace Branch of Cutshin Creek, west side of trail, in root on east side of 1-foot black gum tree; copper nail marked "1587.6" ..	1,587.11
Farler, 3.4 miles south of, 300 feet south of branch from west, 200 feet southeast of house standing on west side of creek, south side of trail, east side of creek, at ford, in top of rock; chiseled square marked "1406.1" ..	1,405.58

Farler, 2.6 miles south of, 600 feet south of mouth of Adams Branch, at bend in creek to west, north edge of timber at forks of trail, east side of trail to south, south side of trail to west, 20 feet west of 2.5-foot white oak tree, 30 feet south of 2-foot beech tree, 50 feet west of Adams Branch, in top of large flat rock; aluminum tablet stamped "1262"	Feet 1,261.977
Farler, 1.9 miles south of, 20 feet north of Saws Branch, 5 feet south of gate on west side of road, in front of Wm. Caudill's residence, at foot of fence, in top of stone; chiseled square marked "1180.5"	1,180.04
Farler, 0.6 mile south of, east bank at mouth of Mud Lick (Fields Fork), west bank of Right Fork, in root on south side of 1.5-foot sycamore tree; copper nail marked "1101.3"	1,100.83
Farler, 700 feet east of, 300 feet west of road forks, north side of road, south side of creek, in root on east side of 2-foot sycamore tree; 2 fence staples marked "1084.1"	1,083.60
Farler, 1,150 feet east of postoffice, 150 feet east of forks of road, 150 feet west of small house standing on north side of road (first house east of postoffice and road forks), 50 feet north of and 13 feet above creek at ford, on top of sharp projecting sandstone rock; aluminum tablet stamped "1093"	1,092.528
Masu station, 3.4 miles southwest of, 75 feet east of mouth of Wootens Fork, on north bank of creek, in root 3 feet west of 3-foot sycamore tree; three 8-penny nails marked "1053.7"	1,053.21
Masu station, 2.1 miles southwest of, northwest corner of intersection of creeks, mouth of Big Branch, in top of rock; chiseled square marked "1006.97"	1,006.45
Masu station, 1.2 miles southwest of, at bend in creek and road to west, 70 feet west of bend, 75 feet east of ford, north side of road, south bank of creek, in root on road side of 10-inch pine tree; four 8-penny nails marked "963.9"	963.34
From point near Kona station southwest along Lexington & Eastern Ry. to Blackey station (Indian Bottom postoffice) and 0.7 mile west of.	
Kona station, 1.2 miles northwest of, 460 feet east of mouth of Millstone Creek, 270 feet east of store house, in front of house owned by Minnie Venter, on top of north end of culvert under railroad; chiseled square marked "1234.5"	1,234.44
Kona station, 1.7 miles northwest of, 0.4 mile southwest of mouth of Millstone Creek, on top of parapet of east abutment north side of track of railroad bridge over North Fork of Kentucky River; chiseled square marked "1230.7"	1,230.69

Mayking station, 2 miles northeast of, at mouth of Thornton Creek (Sergent postoffice), on west concrete abutment, top of south end of parapet wall of railroad bridge over Thornton Creek; aluminum tablet stamped "1222"	Feet 1,221.857
Mayking station, 1.3 miles northeast of, on top of east end of parapet wall of north abutment of railroad bridge over North Fork of Kentucky River; chiseled square marked "1217.0"	1,216.97
Mayking station, 0.7 mile northeast of, 15 feet west of road crossing at railroad center stake; copper nail marked "1213.1"	1,213.08
Mayking station, 0.25 mile northeast of, double undergrade crossing opposite Mayking postoffice, south crossing, in top of west end of plank abutment; copper nail stamped "1207.7"	1,207.59
Mayking station, in front of station; top of north rail	1,208.0
Mayking station, opposite mouth of Bottom Fork, 40 feet south of track, 40 feet east of station board, in root on west side of 2-foot walnut tree; copper nail stamped "1202.5"	1,202.42
Mayking station, 0.8 mile southwest of, 90 feet east of road crossing, on top of north end of stone culvert under railroad; chiseled square marked "1191.8"	1,191.76
Mayking station, 1.6 miles southwest of, at mouth of Friday Branch, on top of east end of stone culvert under railroad, chiseled square marked "1173.0"	1,172.91
Whitesburg, 2.6 miles northeast of, 0.2 mile north of mouth of Colly Creek, at milepost Lex. 182 on west side of track, in face of rock cut; aluminum tablet stamped "1181"	1,181.051
Whitesburg, 2.5 miles northeast of, at mouth of Colly Creek, in top of south plank abutment, east plank wall of railroad trestle over mouth of Colly Creek; copper nail marked "1174.6"	1,174.49
Whitesburg, 1.8 miles southeast of, 30 feet north of road crossing, in east side of track, in base of telegraph pole; spike marked "1166.6"	1,166.49
Whitesburg, 1 mile southeast of, on top of north end of plank wall at west abutment of railroad trestle over mouth of branch from north; copper nail marked "1163.6"	1,163.49
Whitesburg, 0.6 mile southeast of, on top of west end of parapet wall at north abutment of railroad bridge over North Fork of Kentucky River; chiseled square marked "1156.4"	1,256.26
Whitesburg, 300 feet east of station, north side of track and west side of road at road crossing, on top of stone; chiseled square marked "1144.9"	1,144.71
Whitesburg, in front of Lexington & Eastern Ry. station; top of rail	1,146.6

Whitesburg, at northeast corner of Letcher County courthouse, in face of stone foundation; aluminum tablet stamped "1163"	Feet 1,162.765
Whitesburg, 0.5 mile northwest of, on top of west end of parapet wall at north abutment of railroad bridge over North Fork of Kentucky River; chiseled square marked "1142.8"	1,142.65
Whitesburg, 1.25 miles northwest of, on top of south parapet wall of east abutment of railroad bridge over North Fork of Kentucky River; chiseled square marked "1132.0"	1,131.85
Whitesburg, 2.4 miles northwest of, 1.1 miles northeast of mouth of Big Cowan Creek, 120 feet north of house owned by Bob Day, on top of east end of stone culvert under railroad; chiseled square marked "1114.9"	1,114.68
Whitesburg, 3.7 miles northwest of, 160 feet west of railroad bridge over Cowan Creek, on top of south end of stone culvert under railroad near mouth of Big Cowan Creek; chiseled square marked "1110.6"	1,110.36
Uz station, 1.1 miles east of, 30 feet west of private crossing, 200 feet west of point of ridge from south, in front of house standing on south side of track, on north side of track, in base of telegraph pole; spike marked "1098.4"	1,098.15
Uz station, 0.6 mile southeast of, at west end of tunnel, in top of south parapet wall of west abutment of Lexington & Eastern Ry. bridge over North Fork of Kentucky River; chiseled square marked "1091.9"	1,091.69
Uz station, 10 feet south of track, 30 feet north by 30 feet east of Nick Ison's store, 1 foot lower than rail, in top of south end of stone culvert under railroad; chiseled square marked "1079.4"	1,079.19
Uz station, 0.6 mile southwest of, on top of west end of parapet wall of south abutment of railroad bridge over North Fork of Kentucky River; chiseled square marked "1074.1"	1,073.87
Uz station, 1.9 miles southwest of, 600 feet west of mouth of Kingdom Come Creek, on top of south end of parapet wall of east abutment of railroad bridge over North Fork of Kentucky River; aluminum tablet stamped "1064"	1,063.678
Uz station, 2.7 miles west of, top of bolthead south side of track in guard rail at east end of railroad trestle bridge over mouth of Smoot Creek; painted square marked "1056.3"	1,056.08
Roxana station, 1.5 miles northeast of, at point where road turns to northwest leaving railroad to cross point of ridge, on top of north end of stone culvert under railroad; chiseled square marked "1047.8"	1,047.53
Roxana station, 750 feet east of, 500 feet west of postoffice, opposite mouth of King Creek, 70 feet east by 30 feet south of undergrade crossing, 30 feet south of road, in rock ledge; aluminum tablet stamped "1048"	1,047.847

Roxana station, 1.1 miles northwest of, 750 feet east of mouth of creek from south, at mouth of drain from north (east drain of finger spurs from north), north end of stone culvert under railroad, on top; chiseled square marked	Feet 1,025.11
Blackey station, 2.3 miles south of, at south end of deep cut just south of bend in river and railroad to east, opposite store house and mill dam, east side of track, on level with rail, on top of rock; chiseled square marked "1018.8"	1,018.52
Blackey Station, 1.2 miles south of, on top of west end of parapet wall of south abutment of Lexington & Eastern Ry. bridge over North Fork of Kentucky River; chiseled square marked "1008.3"	1,008.04
Blackey station (Indian Bottom postoffice), just east of, 0.3 mile northwest of mouth of Rockhouse Creek, south abutment east concrete wing wall of highway bridge over North Fork of Kentucky River, in top; aluminum tablet stamped "1000"	999.348
Blackey, in front of station; top of rail	998.3
Blackey station, 0.7 mile northwest of, opposite and 300 feet west of mouth of Elk Creek, in front of I. D. Caudill's residence, on north side of track, on top of north end of stone culvert under railroad; chiseled square marked "991.8"	991.48

From Mouth of Big Cowan Creek south along highways to Partridge postoffice, thence east to Oven Fork.

Whitesburg, 3.7 miles northwest of, 400 feet south of mouth of Big Cowan Creek, on west side of creek, in top of rock ledge; aluminum tablet stamped "1104"	1,103.400
Dongola, 0.25 mile west by 0.6 mile northwest of, at mouth of Browns Branch, on rock bottom in center of Browns Branch, on south side of Big Cowan Creek; chiseled square marked "1119.7"	1,119.51
Dongola, 0.25 mile west of, on west side of mouth of Little Cowan Creek at forks, 15 feet above bed of stream, in face of rock ledge; aluminum tablet stamped "1149"	1,148.362
Dongola, 0.25 mile west by 0.5 mile southeast of, at mouth of branch from east, on west side of road, on east side of Cowan Creek, in root on creek side of 2-foot sycamore tree; copper nail marked "1152.8"	1,152.54
Mandrake, 1.4 miles northeast of, at mouth of Bart Ester branch from east, east side of Cowan Creek and west side of road, 40 feet east of mouth of branch, in root on east side of 2-foot sycamore tree; copper nail marked "1184.3"	1,184.12
Mandrake, 0.4 mile northeast of, east side of mouth of Joe Fraziers Branch, 60 feet northeast of intersection of creeks, on north side of road, in root on road side of 2-foot sycamore tree; copper nail marked "1270.1"	1,269.89

Mandrake, 0.4 mile southwest of, opposite mouth of Meeting House Branch, 23 feet northeast of northwest corner of schoolhouse, on south side of Cowan Creek, on top of large sandstone rock; chiseled square marked "1330.2".....	Feet 1,329.96
Mandrake, 0.8 mile west of, in center of road forks at road leading north to Kingdom Come Creek, north side of east-west road, on top of sandstone rock; chiseled square marked "1373.9"	1,373.66
Mandrake, 1.2 miles southwest of, 225 feet south of road forks, on west side of road and east side of small branch from south, road leading south across Pine Mountain, in top of large sandstone rock; aluminum tablet stamped "1434".....	1,433.548
Mandrake, 1.2 miles southwest by 0.7 mile south of, at bend in road to west on hillside, at upper edge of clearing on east side of road, on west side of road at point in road, on top of rock; chiseled square marked "1895.96".....	1,895.73
Mandrake, 1.2 miles southwest by 1.2 miles south of, at first intersection of road and creek on mountain side, south side of road, east side of creek, on top of sandstone rock; chiseled square marked "2188.9" ..	2,188.71
Partridge, 1.9 miles north of, top of Scuttle Hole Gap in Pine Mountain between Partridge and head of Big Cowan Creek, 45 feet south of summit, on east side of road, on top of sandstone rock; aluminum tablet stamped "2518".....	2,517.738
Partridge, 1.3 miles north of, east side of road on mountain side, at end of spur where road turns down steep grade to southeast, in root on road side of 1.5-foot chestnut-oak tree; copper nail marked "2358.0"	2,357.76
Partridge, 0.9 mile north of, at gap in spur, road turns to west side of spur at south end of gap, at bend in road to west, on east side of road, in root on west side of 2-foot chestnut tree; copper nail marked "2113.0".....	2,112.69
Partridge, 0.3 mile northeast of, on west side of road, north side of gap in spur, at base of telephone pole, in root on south side of old 2-foot stump; copper nail marked "1753.6" ..	1,753.35
Partridge, 50 feet west of postoffice, 140 feet west of road forks, 90 feet west of branch from north, on north side of road, in top of rock outcrop; aluminum tablet stamped "1585"	1,584.723
Partridge, 0.7 mile northeast of, at north end of loop in river, north bank of river, south side of road at cove to north, 200 feet east of house, four small pine trees, in root of west dead tree on road side; copper nail marked "1580.5".....	1,580.19
Partridge, 1.4 miles northeast of, bend in road to south, 300 feet north of mouth of Horseshoe Branch, in center of road at bend in front of Hiram Raleigh's residence, east side of branch, on top of stone; chiseled square marked "1586.1"	1,585.82

Partridge, 1.8 miles northeast of, 50 feet east of church, 175 feet east of ford, on north side of road, in root on road side of 14-inch hickory tree; copper nail marked "1596.7"....	Feet 1,596.44
Partridge, 2.5 miles northeast of, at foot of ford across Cumberland River, north side of where road crosses low gap in spur, west side of river, north side of road at water's edge, on top of stone; chiseled square marked "1595.8".....	1,595.47
Partridge, 3 miles northeast of, at bend in road and river to south at mouth of branch from north, 40 feet north of road, 20 feet east of branch, 15 feet east of forked pine tree, 10 feet west of center of west side of blacksmith shop owned by Henry Maggard, in top of sandstone rock; aluminum tablet stamped "1624" . . .	1,623.984
Partridge, 3.9 miles northeast of, 0.4 mile northwest of mouth of Franks Creek, in southeast corner of bend to east in road, in front of residence of Jake Day, in root on road side of 1-foot butternut tree; copper nail marked "1647.4".....	1,647.14
Partridge, 4.3 miles northeast of, 120 feet west of road forks at mouth of Franks Creek, 250 feet east of residence of Collier's heirs, on north side of road, at fence corner, in root on road side of 2.5-foot white oak tree; copper nail marked "1640.7"	1,640.38
Eolia, 0.9 mile west of, 0.25 mile north of mouth of creek from southwest at house on east side of road, 250 feet north of bend in road to east, southwest corner of road forks, at west end of gate, in base of fence post; copper nail marked "1645.5".....	1,645.19
Eolia, 70 feet west of road to south, in yard of public schoolhouse, 35 feet south of branch, 45 feet east of schoolhouse, in top of sandstone rock about 15 inches above ground; aluminum tablet stamped "1685" . . .	1,685.187
Eolia, 1.1 miles east of, at foot of hill between Meadow Fork and Meadow Branch, 175 feet southeast of barn of William Stergill, 100 feet southeast of bend in road to southeast, 10 feet south of road, in root on south side of 2.5-foot chestnut tree; copper nail marked "1859.7".....	1,859.42
Oven Fork, 0.3 mile southwest of, 40 feet northeast of top of ridge, 15 feet north of road at point where it crosses ridge, in root on road side of 3.5-foot chestnut tree; copper nail marked "2109.1" . . .	2,108.77
Oven Fork, in front of postoffice, 30 feet west of stream crossing, south side of road, at foot of corner fence post (second post west of gate), on top of flat rock; chiseled square marked "2022.9" . . .	2,022.62
Oven Fork, 0.5 mile east of, at foot of east side of hill on Meadow Branch, in center of road forks, on top of stone; chiseled square marked "1911.06"	1,910.74

Oven Fork, 0.6 mile east of, at forks of Meadow Branch, 70 feet west of stream crossing, 100 feet north of residence of A. A. Sergeant, east side of second-class road to south, south side of road at intersection, at base of 3.5-foot white oak tree, in top of large flat rock; aluminum tablet stamped "1879" 1,878.215

From Blackney station northeast along highways to Colson, thence west to mouth of Troublesome Creek.

Blackey station, 0.9 mile northeast of, 300 feet southwest of mouth of Branson's Branch, at north end of foot log to H. B. Branson's residence, on south side of road, on top of large rock; chiseled square marked "1001.9" 1,001.60

Blackey station, 1.9 miles northeast of, at mouth of Caudillis Branch, north side of road, east side of branch, in rock ledge; chiseled square marked "1013.0" 1,012.66

Blackey station, 3.4 miles northeast of, 300 feet northeast of mouth of Perkins Branch, trail to south, on north bank of Rockhouse Creek, south side of road, 40 feet east of small drain from north, in root on road side of 2-foot walnut tree; copper nail marked "1040.9" 1,040.58

Jeremiah, 0.7 mile southwest of, 0.6 mile northwest of mouth of Spring Branch, on north side of Rockhouse Creek, 40 feet north of road, 200 feet south of residence of Orbin Stergill, 0.2 mile east of James T. Smith's residence, store, and mill dam, on east bank of small branch from north, in rock ledge; aluminum tablet stamped "1062" 1,061.355

Jeremiah, 0.2 mile south of, at mouth of Dotty Branch, 50 feet south of branch from west, in front of Grant Isom's residence, west bank of Rockhouse Creek, in root on west side of west tree (forked sycamore tree, one trunk 18 and the other 15 inches in diameter); copper nail marked "1058.04" 1,057.74

Jeremiah, 0.8 mile northeast of, 100 feet north of where road crosses Blair's Branch, on west side of road, in top of knot on road side of 3-foot ash tree, 2 feet above ground; copper nail marked "1074.8" 1,074.53

Isom, 0.7 mile southwest of, 200 feet west of second-class road to north, at mouth of Garner Branch, at mill and dam, northeast corner of mill, top of north end of sill of mill building, south side of road; copper nail marked "1086.4" 1,086.11

Isom, 0.2 mile east of, 375 feet east of mouth of Little Colly Creek, 40 feet north of road forks, on east side of and 3 feet above road, in rock ledge; aluminum tablet stamped "1107" 1,106.839

Isom, 1.1 miles northeast of, on north bank of Rockhouse Creek, 40 feet northwest of ford of third-class road to southeast, 180 feet east of Henry Comb's residence, on south side of road, in root on road side of 2-foot birch tree; copper nail marked "1114.2" 1,113.92

Isom, 2 miles north east of, on north bank of Rockhouse Creek, 125 feet east of mouth of Daniel Branch, south side of road, in root of 15-inch sycamore tree, the middle one of three; copper nail marked "1125.4" 1,125.07

Colson, 1.8 miles southwest of, at mouth of Millstone Branch, north bank of Rockhouse Creek, west side of branch, south side of road, in projecting root on road side of 15-inch birch tree; copper nail marked "1135.5" 1,135.21

Colson, 0.9 mile southwest of, at mouth of Low Gap Branch, on south side of Rockhouse Creek, west side of branch, at fence corner, in root on north side of 1-foot sycamore tree; two 8-penny nails marked "1142.1" 1,141.78

Colson, at mouth of Camp Branch, in center of road forks, on top of rock; chiseled square marked "1151.2" 1,150.87

Colson, at mouth of Camp Branch, 500 feet east of road forks, 540 feet west of postoffice, 135 feet east of Cal Crawford's residence, 50 feet east of small drain from north, 20 feet northeast of 2-foot elm tree, north side of road and 7 feet above road, in rock ledge; aluminum tablet stamped "1172" 1,172.165

Colson, 1 mile north of, south side of mouth of Trace Branch, on west side of Rockhouse Creek, east side of wagon road, in root on road side of 2.5-foot elm tree; 20-penny spike marked "1152.04" 1,151.74

Colson, 1 mile north by 1.6 miles northwest along Trace Branch, at east end of bend in road to east, on hillside about 400 feet west of house in hollow to east, on west side of road, north side of drain, at foot of 5-inch red-haw tree, in top of small stump; 20-penny spike marked "1380.1" 1,379.78

Bath, 0.3 mile southeast of, forks of Little Carr (Amburgy) Creek at its head, at foot of north side of gap, 350 feet west of C. B. Logan's residence, 85 feet east of intersection of creeks, on south side of road, inside of fence line, in root on east side of 2-foot hickory tree; two 20-penny spikes driven in, marked "1298.5" 1,298.20

Bath, 375 feet east of postoffice, 200 feet west of William Collier's residence, 50 feet northwest of 3.5-foot oak tree, 20 feet above bed of Little Carr Creek on north side, in sandstone ledge; aluminum tablet stamped "1281" 1,280.929

Bath, 0.6 mile northwest of, on north bank of Little Carr (Amburgy) Creek, 50 feet southeast of schoolhouse, 50 feet west of southeast corner of yard, in root on north side of 5-inch sycamore tree; copper nail marked "1198.6" 1,198.33

Bath, 1.7 miles west of, 190 feet north of mouth of Big Double Branch, south side of road, west bank of Little Carr Creek, in front of small log house, in root on north side of 8-inch tree; copper nail marked "1118.8"	Feet 1,118.54
Bath, 2.4 miles west of, at mouth of Wolfpen Branch, on north side of Little Carr Creek, south side of and 10 feet under road, 300 feet east of bend in creek to north, opposite mouth of Wolfpen Branch, on top of rock in bank of creek; chiseled square marked "1075.1"	1,074.85
Bath, 3 miles west of, bend in road to west at small branch from northeast, 60 feet north of branch crossing, 20 feet east of center of road, opposite house standing on west side of road, in trunk of west tree of row of four apple trees inside of fence line, 1 foot above ground; copper nail marked "1086.6"	1,086.32
Bath, 4.1 miles west of, at mouth of Little Carr (Amburgy) Creek on west side of Carr Fork, at center of road forks, 30 feet north of northeast corner of schoolhouse yard, on top of rock; chiseled square marked "1027.2"	1,026.95
Bath, 4.1 miles west of, 40 feet northwest of northwest corner of schoolhouse, 100 feet southwest of road forks, 150 feet west of Carr Fork, on north side of road, in root on south side of 2-foot walnut tree; copper nail marked "1034.7"	1,034.60
Pine Top, 4.3 miles southwest of, 635 feet east of mouth of Betty Troublesome Creek, north bank of Carr Fork, south side of road, 20 feet from water's edge, in top of large rock; aluminum tablet stamped "1034"	1,034.444

BREATHITT, KNOTT, AND PERRY COUNTIES.

The elevations in the following list were determined by primary levels extended from the precise level line, Lexington to Jackson.

The leveling was done in 1911 by S. R. Archer.

From point 6.8 miles south of Jackson southeast along highway up Troublesome Creek to mouth of Fugitt Branch.

Quicksand, 4.5 miles southwest of, 125 feet east of C. Thomas's house, on south side of road near barn; chiseled square on top of stone, marked "768.3"	768.27
Lost Creek, 1.7 miles northwest of, road forks at mouth of Troublesome Creek, south side of road, 20 feet east of Watt's store, at foot of fence; chiseled square on top of stone, marked "747.8"	747.80

Lost Creek, 0.5 mile northwest of, at residence of Sweet Landrum, south side of road, at northwest corner of small storehouse at roadside; chiseled square on top of stone, marked "780.9"	Feet 780.93
Lost Creek, in top of east abutment at north end of steel highway bridge over Troublesome Creek; aluminum tablet stamped "751"	750.611
Clayhole, 0.45 mile southwest of, 75 feet south of road fork at T road southeast, northwest of mouth of Riley's Branch; copper nail in north root of 2-foot oak tree, marked "945.4"	945.46
Clayhole, on west bank of Rileys Branch, just south of road forks, in front of post office, at water's edge of creek; chiseled square on top of rock, marked "823.8"	823.85
Clayhole, 0.7 mile southeast of, road forks at mouth of Clayhole Branch, on north bank of Troublesome Creek, on west side of bend in main road to east; copper nail in root on north side of 30-inch sycamore tree, marked "764.7"	764.71
Clayhole, 1.4 miles southeast of, at mouth of Russell Creek, 200 feet west of creek, on north side of road, at private road north to house, in rock cliff; aluminum tablet stamped "763"	763.205
Lost Creek, 5.2 miles east of, at mouth of Harveys Branch, in bed of stream in front of Nathan Miller's residence, 75 feet north of road forks; chiseled square on top of huge rock, marked "770.9"	770.92
Lost Creek, 6.1 miles east of, opposite mouth of Caney Creek, north side of road at road forks; chiseled square on top of rock outcrop, marked "766.3"	766.38
Lost Creek, 6.7 miles southeast of, along Troublesome Creek, at bend in creek to southeast, 0.7 mile above Caney Creek, at schoolhouse, north side of road, west side of small stream; chiseled square on top of large sandstone rock, marked "776.0"	776.10

From Lost Creek south along highway up Lost Creek to point 2.8 miles southeast of Ned post office.

Lost Creek, 0.9 mile south of, stream crossing and second-class road to west, at residence of Lee Deaton, at southeast corner of small store just south of house on north bank of stream; chiseled square on top of rock, marked "741.1"	742.09
Lost Creek, 2.8 miles south of, in front of M. C. Grigsby's residence, on east bank of Lost Creek, on west side of public road; copper nail in root of second beech above ford, marked "760.0"	759.99

Lost Creek, 3.4 miles southeast of, 160 feet north of mouth of Leatherwood Creek, on west bank of Lost Creek, in foundation stone at southeast corner of Tom Watt's store; aluminum tablet stamped "769".....	768.929
Lost Creek, 4.8 miles southeast of, 1.4 miles southeast of mouth of Leatherwood Creek, 175 feet west of C. J. Noble's residence, north side of road at southeast corner of private cemetery, at foot of fence; chiseled square on top of stone corner post, marked "821.6".....	821.57
Ned, 1.1 miles northwest of, north side of road at bend to east, at residence of Z. Neace, 50 feet east of top of rise; chiseled square on top of stone, marked "888.6".....	888.63
Ned, 0.4 mile northwest of, at road forks, at residence of Wash Noble, in northeast corner of stream confluence, at foot of stone cliff; copper nail in root on north side of 3½-foot sycamore tree, marked "798.4".....	798.39
Ned, in stone support to porch at southwest corner of residence of Jerry Combs (postmaster), 150 feet north of mouth of Cockrell Fork, on east side of road; aluminum tablet stamped "808".....	808.469
Ned, 1.2 miles south of, about 60 feet below mouth of Ten-mile Creek, on east bank of Lost Creek, at water's edge, at foot of rock ledge; chiseled square on top of flat rock, marked "816.0".....	815.98
Ned, 2 miles southeast of, 0.8 mile southeast of mouth of Tenmile Creek, 150 feet west of bend in road to southeast and 250 feet west of mouth of small stream from north, on north bank of Lost Creek, on south side of road; chiseled square on top of a large rock, marked "831.3".....	831.28
Ned, 2.8 miles southeast of, 1.6 miles southeast of county line between Breathitt and Perry Counties, at bend in road and creek to east, about 0.2 mile west of Elias Mullen's milldam, 75 feet east of mouth of small stream from south, in front of B. W. Watt's residence, south side of Lost Creek, in face of rock ledge; aluminum tablet stamped "841".....	841.245
From mouth of First Creek along highway west to Shoal, thence north down Middle Fork of Kentucky River to mouth of Puncheon Camp Creek.	
First Creek, opposite mouth of, on west bank of North Fork of Kentucky River, on east side of public road; copper nail in root on road side of 42-inch sycamore stump, marked "822.2".....	822.17
Yerkes, 4 miles southeast of, 0.6 mile northwest of mouth of First Creek, at bend in river to north, opposite tunnel of Louisville & Nashville R. R., in front of James Stacy's residence and general store, on west bank of river, on east side of road, in face of large rock on roadside; aluminum tablet stamped "841".....	841.033

Yerkes, 2.9 miles southeast of, bend in river to southwest, on west bank of river, 100 feet above ford opposite mouth of Second Creek, on east side of road; chiseled square on top of sandstone rock set vertical, marked "821.7".....	821.63
Yerkes, 2 miles east of, 1.1 miles above mouth of Willard Creek, 0.3 mile east of bend in river to southwest, on south bank of river, in front of Elhannon Fugitt's residence, north side of Louisville & Nashville R. R.; chiseled square on top of large rock, marked "826.4".....	826.31
Yerkes, 0.8 mile east of, on North Fork of Kentucky River, at old mouth of Willard Creek on east bank of river at bend to west, 150 feet north of Grant Campbell's store, 400 feet south of road to southeast; copper nail in root on east side of 30-inch forked elm tree, marked "805.8".....	805.71
Yerkes, North Fork of Kentucky River, at Louisville & Nashville R. R. stone culvert, at mouth of Forked Mouth Creek, 300 feet north of A. D. Campbell & Sons' store, in bridge seat at northeast corner of bridge; aluminum tablet, stamped "803".....	802.609
Yerkes, 0.6 mile west of, on Forked Mouth Creek, at forks of stream just above schoolhouse, at foot of hill to southwest, on west side of intersection of two forks; chiseled square on top of stone, marked "857.9".....	857.83
Yerkes, 1 mile southwest of, on South Fork of Forked Mouth Creek, 0.4 mile southwest of schoolhouse, at mouth of stream from southeast, west side of road at bend to southwest; chiseled square on top of stone, marked "991.6".....	991.57
Yerkes, 1.3 miles southwest of, on Forked Mouth Creek, at residence of James Olliver, at mouth of small stream from west, at junction of creeks; chiseled square on top of stone, marked "1023.3".....	1,023.27
Yerkes, 1.9 miles southwest of, at forks at head of southwest fork of Forked Mouth Creek, at foot of hill and bend in road to southwest, 200 feet north of Ira Baker's residence, 50 feet south of fence corner on west side of creek, 40 feet south of bend in road; copper nail in root of 12-inch poplar tree, marked "1111.6".....	1,111.60
Yerkes, 2.4 miles southwest of, at top of Ivy Gap, between heads of Forked Mouth and Trace Fork creeks, at county line between Perry and Leslie counties, north side of road; copper nail in root on south side of small blazed oak tree, marked "1335.2".....	1,335.16
Confluence, about 1 mile northeast of, 1.5 miles up Trace fork, at fork of South Fork near its head, on south side of trail at forks of trail; copper nail in root on north side of 30-inch beech tree, marked "1054.6".....	1,054.60

Confluence, about 1 mile northeast of, at road forks, 0.9 mile up Trace Fork, north bank of South Fork at forks of creek, in front of house; copper nail in top of sycamore stump, marked "843.25"	Feet 843.22
Confluence, about 1.2 miles northeast of, on Middle Fork of Kentucky River, 450 feet south of mouth of Trace Fork, 0.25 miles north of mouth of Grassy Creek, on west bank of Middle Fork at water's edge, in top of large sandstone rock; aluminum tablet, stamped "786".....	786.110
Confluence, 2.25 miles northeast of, opposite mouth of Poundmill Branch, at bend in river to west, on east side of road, on top of rise 40 feet above river on west bank; copper nail in root on road side of 30-inch beech tree, marked "807.5"	807.48
Confluence, 2.5 miles north of, 0.25 mile west of Poundmill Branch, at mouth of small stream from north, at ford, on west bank of river; copper nail in root on north side of sycamore stump, marked "772.4".....	772.33
Confluence, 3.7 miles northwest of, opposite George Begley's residence, 20 feet north of fence line between Jasper Langdon's and Polly Mosier's lands, 70 feet east of east bank of river, 0.24 mile south of bend in river to west; copper nail in root on east side of small apple tree, marked "796.3".....	796.30
Shoal, 6.6 miles northeast of, at road forks, 100 feet east of mouth of Langdons Branch, in front of Jasper Langdon's residence, on north bank of river, at road to northwest; copper nail in sycamore stump, marked "768.4"	768.38
Shoal, 6.25 miles northeast of, on west bank of Middle Fork of Kentucky River, 0.4 mile south of mouth of Langdons Branch, in west face of large sandstone rock; aluminum tablet stamped "771"	771.194
Shoal, 4.9 miles northeast of, just above Opossum Bend, on south bank of Middle Fork of Kentucky River, at mouth of Spring Branch, 280 feet east of Simon Langdon's residence; copper nail in root on river side of 3-foot forked sycamore tree, marked "760.8"	760.76
Shoal, 3.7 miles northeast of, at north end of Opossum Bend, on south bank of river, 75 feet below mouth of Coal Branch from north, 15 feet above water; copper nail in top of sycamore stump, marked "770.2".....	770.20
Shoal, 2.8 miles northeast of, at trail to southeast, at mouth of small stream, 600 feet north of bend in river to west, just north of old house, on east bank of river, at water's edge; copper nail in root on east side of 42-inch sycamore tree, marked "757.4"	757.44
Shoal, 1.9 miles northeast of, on north bank of river at bend to south, 100 feet west of mouth of small stream from north, 160 feet east of residence of W. E. Bowling, at ford; copper nail in top of sycamore stump, marked "761.3".....	761.28

Shoal, 1 mile northeast of, in northwest corner of road forks, 100 feet west of stream from north; copper nail in root on south side of 8-inch locust tree, marked "784.9".....	Feet 784.93
Shoal, about 0.25 mile north of, opposite mouth of Elkhorn Creek, on north bank of Middle Fork of Kentucky River, on south side of public road, at water's edge, in top of large rock; aluminum tablet stamped "757".....	756.790
Shoal, 1.3 miles northwest of, on north bank of Middle Fork of Kentucky River, at bend to southwest, 150 feet northwest of Garrett Barnes's residence, south side of road, inside of fence; copper nail in root of north side of beech stump, marked "761.3"	761.32
Shoal, 2.2 miles northwest of, 150 feet north of mouth of Turkey Branch, on east side of river, north side of small stream from east, on east side of road; chiseled square on rock marked "766.6".....	766.64
Shoal, 2.6 miles north of, on east side of river opposite mouth of Leatherwood Creek, in front of Nelson Barger's residence, on east side of road at forks; chiseled square on top of rock, marked "778.4".....	778.40
Shoal, 3.6 miles north of, about 400 feet south of John Deaton's store, at mill, 70 feet west of bend in road to north, on north bank of Langdons Branch, at forks of road; copper nail in root of small tree, marked "747.5".....	747.55
Buckhorn, 3.7 miles southeast of, 360 feet north of Jessie Bowling's residence, 60 feet north of barn, on east side of road, about 0.3 mile north of bend in river to north, in side of large rock; aluminum tablet stamped "792"	792.321
Buckhorn, 2.6 miles southeast of, on east bank of river at mouth of Meetinghouse Branch, on west side of road at road forks; copper nail in root of 2-foot beech tree, marked "757.3"	757.29
Buckhorn, 2.1 miles southeast of, at mouth of Guys Creek, 250 feet east of store, on north side of road at forks; chiseled square on top of stone, marked "753.6".....	753.65
Buckhorn, 0.9 mile southeast of, 140 feet east of Alfred Riley's residence, at bend in river to west, 25 feet southeast of small stream from east, on north side of road; chiseled square on top of stone, marked "757.6".....	757.60
Buckhorn, about 0.5 mile east of center of town, at mouth of Squabble Creek, 250 feet west of Middle Fork of Kentucky River at ford, on south side of road, in stone foundation at northeast corner of Rebecca Riley's house; aluminum tablet stamped "748".....	748.185
Buckhorn, about 2.2 miles northeast of, 1,400 feet east of house on south side of river, just below bend to north; copper nail in root of 30-inch beech tree, marked "741.7"	741.70

Crockettsville, 3.1 miles southeast of, on east side of river, just south of residence owned by John Amy, on east side of road, north side of Buck Branch at corner of garden fence; copper nail in top of stake, marked "730.4".....	Feet 730.40
Crockettsville, 2.1 miles southeast of, on east side of river, at northeast corner of bridge over Johnsons Lick Branch, about 0.25 mile below Thomas Branch; copper nail in floor	724.09
Crockettsville, 1.2 miles southeast of, at crossing of stream from east, just north of county line, at northwest corner of Robert Amy's barn; chiseled square on top of rock in bed of creek, marked "732.4"	732.40
Crockettsville, 400 feet north of mouth of Longs Creek, on Middle Fork of Kentucky River, 150 feet north of mill, on east bank of river, opposite sand bar, in top of rock ledge 4 feet above water level; aluminum tablet stamped "710"	709.889
Crockettsville, 0.7 mile north of, on east side of road, at second class road to west at schoolhouse, on west bank of river and on north side of mouth of creek; copper nail in root on road side of 2-foot elm tree, marked "716.0".....	716.05
Crockettsville, 2.4 miles north of, at bend in river to northeast, in front of Louis Noble's residence, 0.7 mile southwest of mouth of Lick Branch, at gate to yard on east side of road; chiseled square on rock, marked "724.5".....	724.52
Crockettsville, 3.1 miles northwest of, opposite mouth of Lick Branch, east side of road at mill, on west bank of river; copper nail in root of 3-foot tree, first sycamore tree south of ford, marked "708.6"	708.68
Canoe, 3.2 miles south of, 650 feet west of mouth of Turner Branch, on north bank of river, on north side of road, 900 feet west of Joe Deaton's residence, in top of rock; aluminum tablet stamped "720"	719.616
Canoe, 2.1 miles southwest of, on west bank of river at bend to north, on north bank of Elsom Creek at mouth; copper nail in root of 30-inch elm tree, with roots bare, marked "701.3"	701.37
Canoe, 1.6 miles southwest of, 75 feet north of mouth of Sebastian Branch, on west bank of river, east side of road; copper nail in root on road side of 30-inch beech tree, marked "702.9"	703.00
Canoe, on west bank of Middle Fork of Kentucky River, opposite mouth of Cance Fork, 50 feet south of ford, on east side of road; copper nail in root on road side of 30-inch forked sycamore tree, marked "702.7"	702.76
Canoe, 1.2 miles northwest of, on east bank of river, opposite Hollands Branch, 250 feet south of house situated on west bank of river and owned by Kent Sebastian, on west side of public road, on south side of creek; copper nail in root on road side of 36-inch maple tree, marked "700.3"....	700.35

Canoe, 2.7 miles northwest of, on north bank of Middle Fork of Kentucky River, at bend to west, 100 feet east of mouth of Mill Creek, on south side of public road, in top of sandstone ledge; aluminum tablet stamped "694"	Feet 693.888
Canoe, 4.6 miles northwest of, 120 feet north of mouth of Old Buck Creek, on east bank of river on west side of public road, in front of store; copper nail in root on east side of 30-inch maple tree with roots bare, marked "691.7"	691.78
Juan, 0.8 mile north of, on north bank 800 feet west of bend to west in Middle Fork of Kentucky River, 900 feet west of stream crossing, on north side of road, in road face of large sandstone rock; aluminum tablet stamped "704"	703.914
Juan, 1.4 miles northwest of, just north of bridge over Middle Fork of Kentucky River, at mouth of Turkey Creek, in southeast corner of road forks, copper nail in west root of 24-inch elm tree, marked "712.2"	712.26
From mouth of Puncheon Camp Creek north along highway to Oakdale.	
Juan, 2.4 miles northwest of, on east side of Middle Fork of Kentucky River, at mouth of Puncheon Camp Creek, 0.6 mile west of Highland College, at northeast corner of road forks; copper nail in root of 30-inch sycamore stump marked "677.5"	677.58
Oakdale, 4.1 miles southwest of, on Puncheon Camp Creek, 0.7 mile east of Middle Fork of Kentucky River, southeast corner of Highland College dormitory, in stone foundation; aluminum tablet stamped "711"	710.670
Oakdale, 3.7 miles south of, 120 feet north of forks of Puncheon Camp Creek, 0.3 mile northeast of Highland College, at residence of B. H. Herald; copper nail in root of 30-inch elm tree, marked "716.4"	716.44
Oakdale, 2.5 miles southeast of, on west side of road, at foot of south side of divide between upper Twin Creek and Puncheon Camp Creek, 100 feet north of house on west side of forks of stream, in root of old stump; copper nail marked "897.9"	897.95
Oakdale, 2 miles southeast of, on top of divide between Twin and Puncheon Camp Creeks, on east side of road, 10 feet north of rail fence; chiseled square on top of small rock, marked "1018.3"	1,018.40
Oakdale, 1.2 miles southeast of, at head of hollow, 250 feet north of bend in road to southeast, 400 feet north of forks of creek, on west bank of West Fork of Twin Creek just above mouth of stream from west; copper nail in root on south side of 24-inch sycamore tree, marked "847.6".....	847.65

Oakdale, 0.4 mile southeast of, at forks of Twin Creek, in front of Elias Spencer's residence, on west side of road at junction of creeks; copper nail in root on west side of sycamore tree, marked "779.4".....	Feet 779.50
Oakdale, in front of Lexington & Eastern Ry. station; top of rail	791.4
Athol, 2.9 miles southeast of, southwest corner of stone abutment of small bridge; aluminum tablet stamped "773" (precise level B. M.).....	773.404

From Jackson south along highway 6.8 miles.

Jackson, in top of west end of stone wall at south side of courthouse yard; aluminum tablet stamped "791".....	791.075
Jackson, 1 mile southeast of, on west side of public road, east bank of North Fork of Kentucky River; copper nail in root (under windlass) of 30-inch elm tree, marked "729.6".....	729.62
Jackson, 2.3 miles southeast of, at small store on west side of public road in front of distillery, plank platform to store; copper nail in top, at northeast corner, marked "751.0".....	750.99
Quicksand, on east side of highway, at east end of steel railroad bridge over North Fork of Kentucky River, in west face of north end of concrete pier; aluminum tablet stamped "732"	731.587
Quicksand, 1.3 miles southwest of, opposite south end of railroad tunnel, just east of bend in road to south, on south side of road; chiseled square on top of sandstone rock, marked "758.9"	758.89
Quicksand, 2 miles southwest of, about 50 feet north of Bud Turner's store, on south side of small ravine, on east side of road; chiseled square on top of stone ledge, marked "743.5"	743.52
Quicksand, 3.5 miles southwest of, 3.6 miles northwest of Lost Creek, on north side of public highway, about 0.25 mile east of bend in road to southeast, at northwest corner of main part of residence of Sylvester Tharp, in west face of stone foundation pillar; aluminum tablet stamped "747".....	747.379

From point 2.8 miles southeast of Ned post office south to First Creek.

Ned, 3.9 miles southeast of, at mouth of small stream from northeast, just east of bend in Lost Creek to south, 0.2 miles below milldam, at foot of point of hill; copper nail in root on north side of small sycamore tree, marked "859.2"	859.15
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Ned, 4.7 miles southeast of, just south of Mason Miller's house, 0.1 mile north of schoolhouse, on east side of road and on south side of Lost Creek; chiseled square on top of stone, marked "882.2".....	Feet 882.13
Ned, 5.4 miles southeast of, just below John Campbell's residence, on east bank of Lost Creek, on west side of road at mouth of Cracker Creek; copper nail in root on east side of walnut tree, marked "899.8"	899.80
Ned, 6.6 miles southeast of, 0.2 mile west of mouth of Sixteenmile Creek, 200 feet west of Wm. Edward's residence, on north side of highway, in sandstone rock; aluminum tablet stamped "926"	926.092
Ned, 6.7 miles southeast of, at mouth of Sixteenmile Creek, on north bank of Lost Creek; copper nail in root on north side of 24-inch sycamore tree, marked "926.5".....	926.46
Ned, 8.1 miles southeast of, 1.3 miles south up Sixteenmile Creek, at residence of Zacharia Fugitts, about 75 feet north of road to east, 100 feet below mouth of small stream from east, on north bank at bend in road and creek to south, at water's edge; chiseled square on rock, marked "995.7".....	995.70
Ned, 8.8 miles southeast of, 2.1 miles south up Sixteenmile Creek, at mouth of Trace Fork, at schoolhouse, T road to southwest leading to head of Second Creek, on south side of Sixteenmile Creek and on east side of Trace Fork, at bend in creek to east; chiseled square on top of sandstone rock, marked "1028.6"	1,028.50
Ned, 9.2 miles southeast of, 2.5 miles up Sixteenmile Creek, 100 feet north of residence of Wilson Campbell, at forks of trail to east leading to Lost Creek, on north side of road, about 125 feet west of stream crossing and bend in road to south, in face of rock ledge; aluminum tablet stamped "1082"	1,082.034
Ned, 9.8 miles southeast of, 3 miles up Sixteenmile Creek, on north side of divide between Sixteenmile Creek and First Creek, in front of residence situated on west side of creek, between forks of creek, 40 feet northeast from northwest corner of picket fence on east side of road; chiseled square on top of sandstone rock, marked "1086.2"	1,086.16
Ned, 10.5 miles southeast of, on top of divide between Sixteenmile Creek and First Creek, on south side of road, 50 feet east of 3-foot oak tree; chiseled square on top of sandstone rock, marked "1460.7"	1,460.63
Hazard, 6 miles northwest of, at head of First Creek, 5.6 miles above mouth, south side of divide between Sixteenmile Creek and First Creek, in front of Wm. Napier's residence, 130 feet north of First Creek, on hillside; chiseled square on top of large rock, marked "1056.7".....	1,056.68

Hazard, 6.1 miles northwest of, 4.1 miles above mouth of First Creek, at forks of First Creek at north foot of Hominy Mill Hill, in front of James Walker's residence, southeast corner of road forks and stream forks, 18 feet above level of creek, in face of sandstone ledge; aluminum tablet stamped "1026"	Feet 1,026.322
Hazard, 6 miles northwest of, on Hazard-Grapevine road where it crosses First Creek, 2.4 miles above mouth, on south side of creek, north side of First Creek road; chiseled square on top of rock, marked "921.1"	921.03
First Creek, in bed of, 1 mile east up from mouth, 150 feet north of ford in front of John Stacy's residence, 160 feet north of mouth of small creek from southeast; chiseled square on top of large rock, marked "880.7"	880.59
From mouth of First Creek along highway east up North Fork of Kentucky River 5.7 miles, thence north over Hominy Hill to First Creek.	
Hazard, 9.6 miles northwest of, on west bank of North Fork of Kentucky River, opposite mouth of First Creek, on east side of public road; copper nail in root on road side of 42-inch sycamore stump, marked "822.17"	822.17
Hazard, 8.7 miles northwest of, on west bank of North Fork of Kentucky River, on north bank of Big Creek, in front of John Field's store; copper nail in root on road side of 48-inch sycamore tree, marked "825.5"	825.48
Hazard, 7.6 miles northwest of, on east bank of North Fork of Kentucky River, 100 feet north of Judge Crawford's residence, 175 feet northwest of stream from north, on west side of road; copper nail in root on road side of 42-inch elm tree, marked "834.3"	834.29
Hazard, 6.7 miles northwest of, on North Fork of Kentucky River, at foot of hill just west of Abijah Combs's residence, on west side of road at stream crossing; chiseled square on rock, marked "853.7"	853.66
Hazard, 5.7 miles northwest of, on North Fork of Kentucky River, 0.3 mile north of bend in road to north, 0.2 mile north of railroad tunnel, on south bank of stream crossing south of Robert Combs's residence, on west side of road; copper nail in root on northeast side of 18-inch ash tree, marked "835.7"	835.65
Hazard, 4.6 miles northwest of, along North Fork of Kentucky River, T road to northwest at schoolhouse, at bend in river to south, 150 feet north of small stream from northwest, on west side of road; copper nail in root on road side of 30-inch chestnut tree, marked "843.3"	843.23

Hazard, 3.9 miles north of, on north bank of North Fork of Kentucky River, at T road to north known as Hominy Mill Hill road, at northeast corner of wooden bridge; nail in root on east side of sycamore tree, marked "839.6"	Feet 839.54
Hazard, 5.4 miles north of, on east side of Hominy Mill Hill road, at top of divide, between First Creek and North Fork of Kentucky River; copper nail in root on road side of 30-inch oak tree, marked "1382.05"	1,391.99
From point 3.9 miles north of Hazard south along road up North Fork of Kentucky River to Hazard. (Run twice.)	
Hazard, 3.2 miles north of, at mouth of Lots Creek, 160 feet north of road forks, 250 feet north of steel bridge over Lots Creek, on east side of road to north, 5 feet above level of road, in rock ledge; aluminum tablet stamped "848"	847.816
Hazard, 1.3 miles north of, just east of bend in river to east, 360 feet west of drain, 250 feet west of blacksmith shop, on north side of road, on south side of river bank; copper nail in root of 24-inch sycamore tree, marked "861.2"	861.12
Hazard, at First National Bank Building, on Main Street, in water table 0.7 foot above sidewalk, 12 feet from northeast corner, 5 feet north of entrance to bank; aluminum tablet stamped "873"	873.280
From mouth of Fugitt Branch, southeast along highway to Vest post office, thence south to Hindman, thence southwest to Elic, thence west to North Fork of Kentucky River.	
Noble (mouth of Buckhorn Creek), 2.7 miles northwest of, at bend in Troublesome Creek and road to southwest, 0.2 mile below mouth of Fugitt Branch, 175 feet west of Tolbert Campbell's residence, on north bank of Troublesome Creek, on south side of road, between two small streams from north, in top of large rock; aluminum tablet stamped "786"	786.544
Noble, 1.8 miles northwest of, at loop in Troublesome Creek, on north side of road, opposite house; chiseled square on top of rock outcrop, marked "867.1"	867.16
Noble, 105 feet east of Allen and Hay's store and post office, in front of blacksmith shop and opposite barn, on Troublesome Creek at mouth of Buckhorn Creek, at small hollow from north, on north side of road, on face of rock cliff; aluminum tablet stamped "792"	792.437
Noble, 1.3 miles east of, at stream crossing from northwest, at bend in Buckhorn Creek to south, on north side of road, in bed of stream; chiseled square on top of large rock, marked "807.0"	807.08

	Feet
Noble, 1.8 miles northeast of, 300 feet north of Buckhorn Creek, on east bank of Bear Branch, at road crossing, on north side of road; chiseled square on top of large rock, marked "802.6"	802.73
Noble, 2.4 miles east of, along Buckhorn Creek, at northeast corner of mouth of Long Fork, opposite A. Hay's residence; chiseled square on top of large rock, marked "803.05".....	803.15
Noble, 3.2 miles east of, opposite mouth of small stream from north, on south bank of Buckhorn Creek, opposite house (on north side); chiseled square on top of flat rock, marked "808.2"	808.31
Noble, 3.8 miles east of, 100 feet north of Buckhorn Creek, 150 feet west of Lewis Branch, on north side of public road; aluminum tablet set horizontally in rock cliff, stamped "832"	832.432
Noble, 4.4 miles east of, along Buckhorn Creek, at northwest corner of mouth of Clemens Fork, in front of Henry Noble's residence; chiseled square on top of small stone, marked "824.8"	824.93
Noble, 5.4 miles east of, 1.5 miles southwest of county line between Breathitt and Knott counties, at south end of loop in Buckhorn Creek, 600 feet south of mouth of stream from southeast, 100 feet west of point in creek; copper nail in root on east side of 8-inch sycamore tree, marked "840.7"	840.80
Noble, 6.9 miles east of, at county line between Breathitt and Knott counties, 200 feet east of mouth of Coles Creek, at point of hill on east side of road and Buckhorn Creek, in rock ledge; aluminum tablet stamped "866"	866.364
Noble, 7.9 miles east of, along Buckhorn Creek, 1.1 miles southeast of county line between Breathitt and Knott counties, at mouth of small stream from north, 0.4 mile below mouth of Dans Fork, beech and ironwood trees about 4 inches in diameter on west side of creek; copper nail in root of a beech tree, marked "883.9".....	884.07
Noble, 9 miles east of, 2.2 miles above county line between Breathitt and Knott counties, on west side of Buckhorn Creek, at bend to south, opposite mouth of Jakes Fork; copper nail in root of old stump, marked "902.9".....	903.05
Noble, 10 miles east of, 0.6 mile north of mouth of Hurricane Fork, on west side of Buckhorn Creek, in bed of stream, 40 feet south of mouth of creek from west; chiseled square on top of flat rock, marked "923.8".....	923.97
Noble, 10.7 miles southeast of, 0.07 mile above mouth of Hurricane Creek, on west bank of Buckhorn Creek, on south side of road at ford, in face of north side of large rock; aluminum tablet stamped "944"	943.870

	Feet
Noble, 11.3 miles southeast of, 0.8 mile east of Hurricane Creek, in bed of Buckhorn Creek, at loop in creek, at upper crossing, on south side of road, at foot of flood gate; chiseled square on top of rock, marked "956.5".....	956.60
Noble, 12.1 miles southeast of, at forks of road to northeast, on south side of stream at forks, in front of schoolhouse; copper nail in root of small sycamore tree, marked "974.5"	974.64
Noble, 13.3 miles southeast of, near head of Buckhorn Creek, at point where public road leads southeast over hill to Balls Fork of Troublesome Creek, in road on west bank of small stream from southeast; copper nail in root on south side of small sycamore tree, marked "1098.9" ..	1,099.10
Vest, 3.8 miles west of, on top of divide between Buckhorn Creek and Balls Fork of Troublesome Creek, on west side of road; chiseled square on top of rock, marked "1385.3"....	1,385.42
Vest, 3 miles west of, along Balls Fork of Troublesome Creek, at road forks, 200 feet north of mouth of small creek, 75 feet north of B. Dobson's residence, opposite barn, at fence line on west side of road leading to Buckhorn Creek, in road face of large rock; aluminum tablet stamped "1021"	1,021.115
Vest, 2.3 miles west of, at T road southeast, at southeast corner of mouth of Laurel Creek on Balls Fork of Troublesome Creek, at water's edge; chiseled square on top of large rock, marked "1012.1"	1,012.26
Vest, 1.6 miles west of, on north side of Balls Fork at mouth of Buck Lick Creek, in root on south side of small tree; copper nail, marked "1026.3"	1,026.45
Vest, 0.7 mile west of, 60 feet west of bend in public road to west, on south side of road, north side of Balls Fork; copper nail in root on road side of large stump, marked "1034.9"	1,035.10
Vest, 550 feet north of road forks, at ford in front of store, about 700 feet north of mouth of Trace Fork, on east bank of Balls Fork, on west side of road, in top of large rock; aluminum tablet stamped "1044".....	1,044.386
Vest, 1.1 miles southeast of, on west side of Trace Fork, in front of southeast corner of John Hayes' barn, 125 feet north of mouth of stream from west; chiseled square on top of flat rock, marked "1112.4".....	1,112.61
Vest, 2.3 miles southeast of, along Trace Fork of Balls Fork near foot of north side of divide between Trace Fork and Ogden Branch, 450 feet south of foot of hill, about 350 feet south of house, on west side of creek; chiseled square on top of rock 20 feet above stream, marked "1234.2".....	1,234.41
Vest, 2.6 miles southeast of, at top of divide between heads of Trace Fork of Balls Fork and Ogden Branch of Troublesome Creek, on west side of road; chiseled square on top of stone, marked "1426.5".....	1,426.72

Hindman, 2 miles west by 1.8 miles northeast of, at foot of hill near head of Ogden Branch, at forks of creek, on west side of road, on south side of creek to northwest; chiseled square on top of stone, marked "1119.2".....	Feet 1,119.45
Hindman, 2 miles west by 1.1 miles northeast of, at trail to east across hill to Hindman, on east side of creek, at northwest corner of fence, in front of house; copper nail in root of willow tree, marked "1068.1".....	1,068.34
Hindman, 2 miles west by 0.3 mile north of, opposite mouth of stream from west at trail leading northwest from Ogden Branch to head of Montgomery Branch, on east side of Ogden Branch; copper nail in root on east side of 36-inch beech tree, marked "1016.8".....	1,017.05
Hindman, 2 miles west of, along Troublesome Creek, 0.05 mile south of mouth of Ogden Branch, on east side of road, in sandstone cliff face; aluminum tablet stamped "1015".....	1,015.709
Hindman, 3.1 miles west of, along Troublesome Creek, at southeast corner at mouth of Big Branch from south; copper nail in east root of spreading sycamore tree, marked "991.23".....	991.23
Hindman, 3.8 miles west of, 20 feet south of mouth of small creek from east, just back of house on Roberts' farm, on east bank of Troublesome Creek, in root of 8-inch willow tree; copper nail marked "986.7".....	986.95
Hindman, 4.9 miles west of, along Troublesome Creek, on east side, 160 feet south of mouth of Mill Creek from south, 40 feet south of front of Peter Hay's house, in rock cliff; aluminum tablet stamped "981".....	981.689
Hindman, 4.9 miles west by 1 mile south of, at mouth of Lower Field hollow, 30 feet south of mouth of small stream from east, on west side of Mill Creek, at foot of rail fence; chiseled square on top of brown sandstone rock, marked "1049.6".....	1,049.87
Hindman, 4.9 miles west by 1.8 miles south of, at road forks at forks of Mill Creek, on south side of creek to east, on east side of Mill Creek; chiseled square on top of stone, marked "1122.4".....	1,122.66
Hindman, 4.9 miles west by 2.8 miles southwest of, on top of divide between heads of Mill and Clear Creeks, in southwest corner of road forks; copper nail in root on road side of 24-inch blazed oak tree, marked "1630.5".....	1,630.73
Hindman, 7.9 miles southwest of, at Stone Gap, on top of divide between heads of Mill, Clear and Lots Creeks, at point where road to Lots Creek leaves divide, on east side of road, in north face of large stone; aluminum tablet stamped "1750".....	1,750.746

Ellic, 1.7 miles northeast of, at foot of south side of divide between Lots Creek and Mill and Clear creeks, at point where road crosses Lots Creek, on south side of creek, on west side of road; chiseled square on top of large rock, marked "1220.8".....	Feet 1,221.02
Ellic, 1.3 miles northeast of, at mouth of Elk Lick Fork on Lots Creek; painted square on top of rock, marked "1148.4".....	1,148.70
Ellic, 500 feet north of post office, 550 feet northeast of mouth of Kelleys Fork, at south side of Lots Creek, 80 feet west of bend in creek to north, at water's edge, on top of large rock; aluminum tablet stamped "1063".....	1,063.654
Ellic, 0.8 mile southwest of, 600 feet west of bend to west in road, at small stream crossing, opposite house standing on south side of Lots Creek, on north side of road; chiseled square on top of stone, marked "1146.7".....	1,146.99
Cordia, 0.3 mile east of, along Lots Creek, 30 feet south of forks of road, at Big Fork Creek, on west side of public road, in root of apple tree; copper nail marked "1008.0".....	1,008.31
Cordia, 1.9 miles northwest of, in front of residence owned by Martin and Benjamin Gerhart, on south side of Lots Creek, at mouth of Clear Fork, in top of large rock; aluminum tablet stamped "960".....	960.641
Cordia, 2.4 miles northwest of, on west side of mouth of Elk Fork, on south side of Lots Creek, 60 feet east of sycamore tree; chiseled square on top of large rock, marked "946.9".....	947.15
Cordia, 3.3 miles northwest of, about 200 feet north of mouth of Sooks Branch from southwest, on west side of Lots Creek, at water's edge, on creek side of large rock; chiseled square, marked "915.3".....	915.62
Grigsby, 260 feet north of mouth of Grigsby Branch, on north bank of Lots Creek at bend to west; chiseled square on top of large rock, marked "898.8".....	899.11
Grigsby, 0.8 mile west of, on north side of Lots Creek, about 0.05 mile west of bend to west, 360 feet west of house, in road face of large rock; aluminum tablet stamped "884".....	884.776
Grigsby, 1.9 miles west of, on south side of Lots Creek, 275 feet east of bend in creek to southwest, 0.2 mile west of Bale Grigsby's residence; chiseled square on top of flat rock, marked "864.4".....	864.73
Grigsby, 3.4 miles west of, on south side of Lots Creek, 1.3 miles east of mouth, 30 feet east of mouth of Trace Fork, at water's edge; copper nail in root of cucumber tree (roots bare), marked "846.0".....	846.28
Hazard, 3.2 miles north of, 160 feet north of road forks, 250 feet north of steel bridge over mouth of Lots Creek, in rock ledge on east side of road to northwest; aluminum tablet stamped "848".....	847.816

BELL AND HARLAN COUNTIES.

The elevations in the following list are based upon a copper bolt in the south edge of east pier of railroad bridge over Flat Creek, 0.7 mile west of Mascot, Tenn., a bench mark of the precise level net. For additional elevations in Middlesboro quadrangle see Tennessee and Virginia lists in bulletins 441 and 434.

The leveling was done in 1903 in Middlesboro quadrangle by W. N. Franklin and F. L. Foust, and in Pineville and Baxter quadrangles by Mr. Foust.

From Cumberland north along Southern Ry. to point near Ferndale Station, thence northeast along highway to Campbells Ford (Percivals Ford). (Mean direct and reverse line.)

	Feet
Cumberland Gap, summit of; on stone post (Kentucky, Tennessee, and Virginia corner); chisel point	1,648.47
Middlesboro, 775 feet south of station, in west end of south abutment of culvert over Cumberland avenue; aluminum tablet stamped "1137 Lexington"	1,136.447
Middlesboro, in front of station; top of rail.	1,138.94
Excelsior, coal mines, in front of store door; top of west rail	1,132.2
Pineville, 6 miles southeast of, 375 feet northwest of Percivals Ford on Cumberland River, south edge of road; iron post stamped "1029 Lexington"	1,028.385

From point 4 miles east of Ferndale east to mouth of Shillaly Creek.

Middlesboro, 8 miles northeast of, 30 feet south of mouth of Shillaly Creek, on Clear Fork of Yellow Creek, south edge of road, in bowlder; bronze tablet stamped "1362 Lexington"	1,362.469
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From Cumberland River west along highway to Wasioto.

Wasioto, in front of station; top of rail	1,025.
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From Wasioto to Pineville.

Pineville, in northeast corner of courthouse; bronze tablet stamped "1012 Lexington"	1,011.622
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From Campbell's Ford northeast along highway to Calloway.

Calloway post office, 200 feet northwest of, 300 feet northwest of residence of J. A. Calloway, 10 feet north of road, in large bowlder; bronze tablet stamped "1082 Lexington"	1,081.923
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From Calloway east along highway to Harlan.

Layman post office, 200 feet west of, 6.5 miles northeast of Calloway, 0.2 mile west of mouth of Forrester Creek, at north edge of road; chisel point on large bowlder	1,116.13
Wallins Creek post office, 2.5 miles northeast of, 700 feet west of residence of Z. B. Wilson, near top of long hill at south edge of road; chisel point on large bowlder	1,178.85
Harlan (Mt. Pleasant), 20 feet east of east corner of courthouse; iron post stamped "1197 Lexington"	1,197.061

From Harlan north along highway to point near mouth of English Fork.

Harlan, 5 miles north of, 200 feet west of west bank of Poor Fork, 0.2 mile south of mouth of English Creek; iron post stamped "1238 Lexington"	1,238.020
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From Harlan southeast along public road to Pansy post office.

Pansy post office, 700 feet north of, 5 miles southeast of Harlan, 300 feet west of Cattrons Creek and Slaters Fork, 300 feet west of Norris Napier's residence, 20 feet east of road; iron post stamped "1328 Lexington"	1,327.589
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From Layman south along highway 1.3 miles.

Layman post office, 1.3 miles south of, west bank of Forrester Creek, 200 feet west of residence of Frank Saylor; iron post stamped "1158 Lexington"	1,158.036
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CLINTON, PULASKI, RUSSELL, AND WAYNE COUNTIES.

The elevations in the following list are based upon Coast and Geodetic Survey bench mark F-5 at Burnside, being a "chiseled square in stone 40 feet south of station, 8 paces from nearest rail, 8 inches from stone wall, 2 inches from each side of a triangle on surface of a stone," the elevation of which is accepted as 772.086 feet above mean sea level.

The leveling in Burnside and Monticello quadrangles was done in 1906 by F. H. West and additional leveling in Monticello, as well as all the leveling in Creelsboro and Jabez quadrangles, was done in 1911 by C. E. Mills.

From Burnside west via Bronston and Sloan to Millsprings.

Bronston, 1.36 miles south from, in chimney on north side of Frisby Mercer's house, east of Monticello pike; aluminum tablet stamped "881"	Feet 884.585
Frazers, 1.5 miles northeast of, 0.5 mile northeast of Mercer Bros.' on east side of pike, in west face of chimney on north side of Mrs. Nan Corbett's house; aluminum tablet stamped "905"	905.006
Frazers, 1.86 miles southwest of, on east side of pike, 0.25 mile north of stage coach "Halfway" station, in north face of chimney on north side of J. B. Hines's house; aluminum tablet stamped "891"	890.914

From Millsprings south via Steubenville to Monticello.

Millsprings, in south face of foundation to J. B. Perrigin's house; aluminum tablet stamped "844"	843.978
Steubenville, 0.5 mile north of, west side of pike, 0.25 mile north of Steubenville oil-pumping station, in north face of chimney, on north side of house; aluminum tablet stamped "917"	916.933
Monticello, 1.5 miles north of, on east side of pike, at T road and pike southwest, in stone support to schoolhouse; aluminum tablet stamped "964"	964.039
Monticello, on north side of front steps to courthouse, in second step from bottom; aluminum tablet stamped "926"	926.010

From Monticello southeast to Oil Valley, thence southwest via Cooper to Shearer Valley.

Monticello, 3.55 miles southeast of, 1.5 miles northwest of Oil Valley, 21 feet from southeast corner of wall around graveyard, 200 yards east from schoolhouse, in wall, on south side of and 5 feet from pike; aluminum tablet stamped "938"	937.786
Oil Valley, at junction of T roads 50 feet northeast from store, 3 feet northeast from and between two 3-foot white oaks, in bowlder; aluminum tablet stamped "966"	966.178
Cooper, 0.5 mile southeast of, at junction of Y roads 200 yards northeast from gate leading to Duncan's farm, in ledge of rock; aluminum tablet stamped "1001"	1,000.938

Shearer Valley, 1.55 miles northeast of, on north side of Shearer Valley-Cooper road, 20 yards east of gate to Cooper's place, in bowlder; aluminum tablet stamped "1074"	Feet 1,073.688
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From Shearer Valley north via Bethesda, Alex, and Susie to Murl.

Bethesda, 0.47 mile west of, on north side of Albany road, 10 paces east of and on opposite side of road from blazed oak tree, in bowlder; aluminum tablet stamped "1101"	1,101.274
Alex, 1.65 miles southwest of, on east side of Albany road, on north side of J. P. Radse's house, in west face of stone chimney; aluminum tablet stamped "1061"	1,060.85
Murl, 0.5 mile south of, on south side of D. W. Rector's house, in chimney; aluminum tablet stamped "1036"	1,035.565

From Murl east to Monticello.

Monticello, 2.55 miles west of, on south side of road, 75 paces west of west bank of Beaver Creek, 5 feet from south side of road, in line with east end of residence building at pipe pumping station, in ledge; aluminum tablet stamped "756" ..	751.613
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From Murl northwest via Parnell to Bart, thence northeast to Dell.

Murl, 2.55 miles northwest of, 200 yards east of intersection of Cooper Branch and Beaver Creek, on north side of Cooper Branch road, at east face of Shelby Cooper's house, in chimney; aluminum tablet stamped "655"	654.803
Parnell, 0.75 mile southeast of, Prim. Trav. Sta. No. 9, at junction of Y roads, in southwest corner of schoolhouse; tablet stamped "1029"	1,028.663
Parnell, 3.15 miles northwest of, 0.09 mile south of deserted house on west side of road in hollow 1 mile south of R. W. Coons' house, 0.75 mile north from nearest house on road south, on west side of road, in rock; aluminum tablet stamped "971"	970.172
Bart, 300 yards northeast of, at east side of R. A. Ramsay's house, in east face of chimney; aluminum tablet stamped "641"	640.244
Palace post office, at north side of, in east face of chimney; aluminum tablet stamped "650"	649.270
Dell, 100 paces south of, in field, 15 paces east of junction of T roads, near large oak stump, 10 paces east of fence, in bowlder; aluminum tablet stamped "Prim. Trav. Sta. No. 7, 989"	988.365

From Dell southeast to Millsprings.

Dell, 4 miles southeast of, 2 miles northwest from Oak Grove schoolhouse, on south side of Monticello-Richards Ferry road, at east side of J. P. Brown's house, in east face of chimney; aluminum tablet stamped "1002".....	Feet 1,001.320
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From Millsprings north along highways 4.7 miles.

Millsprings, in south face of foundation of J. B. Pearrigin's house; aluminum tablet stamped "844".....	843.978
Millsprings, 0.5 mile west of, on north bank of Cumberland River at ford; copper nail in base of 10-inch sycamore tree, marked "591.0".....	591.04
Cumberland River, surface of water at Millsprings ford, April 21, 1911.....	588.
Millsprings, 1.6 miles north of, on Millsprings-Somerset road, in front of G. W. Johnson's orchard, in eleventh post south of northwest corner fence post; copper nail marked "854.1".....	854.12
Millsprings, 2.6 miles north of, on Millsprings-Somerset road, in front of W. L. Barker's residence, on stone wall 1 foot south of gate; chiseled square marked "857.3".....	857.31
Millsprings, 3.2 miles north of, on west side of Millsprings-Somerset road, 100 feet south of T road west, in top of 9 by 9 by 26-inch stone about 2 inches above ground; aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1906, 924".....	923.985
Millsprings, 3.5 miles north of, northeast corner of road forks on White Oak Creek; copper nail in root of 2½-foot beech tree, marked "720.6".....	720.59
Millsprings, 4.7 miles north of, in front of Sam Van Hoosier's residence, in southwest corner of yard; copper nail in top of first fence post east of corner post, marked "947.7".....	947.14

From point near Naomi west along highways to point 1 mile southeast of Vinnie.

Naomi, about 1.8 miles south of, on Robertsport road, about 400 feet north of Cornelius Holcon's residence, on east side of road at T road west going down on Beelick Creek; copper nail in root of small oak tree, marked "993.5".....	993.55
Naomi, about 3 miles west of, on ridge between Beelick and Faubush creeks, in northwest corner of Henry Dalton's yard; copper nail in top of fence post, marked "977.5".....	977.53
Vinnie, about 3 miles southeast of, on west bank of Faubush Creek, in east end of north foundation wall of porch to James M. Ard's residence, 1.5 feet above ground; aluminum tablet stamped "674".....	674.097

Vinnie, about 2.5 miles southeast of, 50 feet south of bend in road in front of Squire Richardson's residence, on west side of road; copper nail in root of black oak tree, marked "967.6".....	Feet 967.58
Vinnie, about 1.8 miles southeast of, at northeast corner of road forks; copper nail in foot of 16-inch white walnut tree marked "947.0".....	947.00
Vinnie, about 1 mile southeast of, on west side of road at road forks on Richardson road; copper nail in root of 2-foot beech tree, marked "945.1".....	945.14

From point 1 mile northeast of Jabez west along highways to point 1.8 miles west by 1.3 miles south of Ono.

Jabez, 0.7 mile northeast of, in center of road forks; copper nail in root of large oak tree, marked "1046.0".....	1,046.06
Jabez, in northwest corner of crossroads; copper nail in root of oak tree, marked "1051.3".....	1,051.35
Jabez, 0.6 mile west of, in southwest corner of T road south, copper nail in base of fence post, marked "1010.5".....	1,010.51
Jabez, 1.1 miles west of, in southwest corner of T road south; nail in root of small oak tree, marked "974.5".....	974.52
Jabez, 1.6 miles southwest of, on Jamestown road, about 500 feet north of road, on south side of house of D. W. Stephens, in west side of large sandstone chimney; aluminum tablet stamped "975".....	975.255
Jabez, 2.6 miles southwest of, 230 feet east of road forks, at Polston school; chiseled square on stone ledge on north side of road, marked "975.3".....	975.37
Jabez, 3.4 miles southwest of, on Jamestown Road, hill on east side of Wolfe Creek, chiseled square on large limestone rock on north side of road; marked "833.6".....	833.62
Ono, 1.1 miles southeast of, 4 miles west of Jabez, 400 feet north of Wolfe Creek at ford, 150 feet south of road forks, 70 feet west of Jamestown road, at foot of hill on Elmer Hughes' farm, in limestone ledge; aluminum tablet stamped "648".....	648.273
Ono, at northeast corner of crossroads; copper nail in root of oak tree, marked "976.1".....	976.17
Ono, 1.1 miles west of, on south side of road at top of hill going down to Caney Fork Creek; copper nail in root of stump of large tree, marked "929.8".....	929.88
Ono, 1.8 miles west of, 350 feet above junction with Caney Fork, on west bank of McFarland Creek, in stone ledge about 3 feet above water level; aluminum tablet stamped "Prim. Trav. Sta. No. 8, 636".....	636.043

Ono, 1.8 miles west by 0.9 mile south of, on Caney Fork, 300 feet south of house, on east bank of creek; painted square on stone ledge, marked "615.8".....	Feet 615.88
Ono, 1.8 miles west by 1.3 miles south of, on east bank of Caney Fork, at bend of creek to west; chiseled square on stone shelf, marked "611.3".....	611.38

From point 3.7 miles southwest of Bart along highways to Bart.

Bart, 3.7 miles southwest of, on north side of road, 200 feet west of Elbert Haford's residence; chiseled square on top of large stone, marked "651.8".....	651.83
Bart, 2.4 miles southwest of, 125 feet northeast of J. C. Miller's residence, 10 feet north of road, in limestone rock; aluminum tablet stamped "676".....	676.018
Bart, 2 miles southwest of, on east side of small creek, on south side of road at T road north uphill; chiseled square on large rock, marked "648.8".....	648.87
Bart, 0.8 mile southwest of, on north side of road; copper nail in root of 12-inch tree, marked "648.5".....	648.52
Bart, on west side of Cumberland River, 100 feet north of Falkenberg and Meadow's store; copper nail in large sycamore tree, marked "613.2".....	613.28
Cumberland River at Bart, surface of water, May 20, 1911....	568.5
Bart, 300 yards northeast of postoffice, in east face of chimney on east side of R. A. Ramsey's house; aluminum tablet stamped "641".....	640.244

From point 1 mile southwest of Naomi along highways to point 1.25 miles south of Naomi.

Millsprings, 6 miles north of, about 1 mile southwest of Naomi, in southwest corner of road forks, 150 feet south of Robertsport road, copper nail in top of stump of 11-inch black walnut tree, marked "983.3".....	983.34
Naomi, about 1.25 miles south of, on Robertsport road, on west side of road, on south side of house of Rufus Tarter, in base of large stone chimney; aluminum tablet stamped "1017".....	1,017.502
Vinnie, about 0.8 mile southwest of, 200 feet east of Sandy Hollow school, 20 feet south of center of road, 15 feet west of haul road to south, in top of limestone rock 9 by 9 inches; aluminum tablet stamped "1055".....	1,055.151

From point 1.8 miles west by 2.2 miles south of Ono south along highways to point 4.6 miles west of Bart.

Ono, 1.8 miles west by 2.2 miles south of, on east side of road, 50 feet south of forks of road on hillside, 100 feet northwest of house; chiseled square on large stone, marked "663.2".....	Feet 663.20
Ono, 1.8 miles west by 3.3 miles south of, on south bank of Wolf Creek, in center of road forks; copper nail in root of large hickory tree, marked "579.7".....	579.69
Bart, 5.7 miles west of, on east bank of Wolf Creek, 425 feet above mouth, east side of road, in north face of large limestone rock; aluminum tablet stamped "611".....	610.604
Bart, 4.6 miles west of, 1 mile southeast of mouth of Wolf Creek, on south side of road at T road north up hill; copper nail in base of fence post, marked "625.5".....	625.55

ANDERSON, BOYLE, GARRARD, JESSAMINE, LINCOLN, MERCER,
AND WOODFORD COUNTIES.

The elevations in the following list are based upon various bench marks of the Coast and Geodetic Survey precise level line passing through this quadrangle.

The leveling was done in 1902 by F. A. Franck and in 1903 by W. Goodwin, Jr.

From Burgin along highway west to Harrodsburg, thence southwest to Mitchellsburg, thence along Louisville & Nashville R. R. east to Shelby City, thence north along highway to Burgin.

Burgin, 300 feet southwest of southwest corner of Cincinnati, New Orleans & Texas Pacific Ry. station, in east foundation wall of Burgin Roller Mills, 33 feet north of southeast corner, 22 inches above ground, 4.5 inches below tin siding; brass bolt (Coast and Geodetic Survey bench mark "M")..	901.169
Harrodsburg, in foundation under northwest corner of courthouse, 0.14 foot above ground; aluminum tablet stamped "870 Lexington." (Reported destroyed, 1912).....	871.108
Perryville, in foundation under northwest corner of Baptist Church, at intersection of Danville and Mitchellsburg pikes; aluminum tablet stamped "851 Lexington".....	851.393
Danville, in front step of courthouse; aluminum tablet stamped "988 Lexington".....	988.535

From Harrodsburg along highway west via Rose Hill to Bruners Chapel and Bestonia. (Single-spur line.)	
Harrodsburg, 1.2 miles from, on southeast side of masonry of bridge over Salt River near Power House; bolt.....	Feet 825.687
Rose Hill, 1.5 miles west of, on Maxwell Pike, east side of Bruners Chapel (Baptist), in masonry; aluminum tablet stamped "921 Lexington".....	921.374
Bestonia, in southwest corner of abutment of bridge crossing Chaplin River; aluminum tablet stamped "747 Lexington"....	746.998
From Mitchellsburg south along highway to Forkland. (Single-spur line.)	
Mitchellsburg, at station; spike in telegraph pole.....	993.55
Forkland, near southeast corner of Calhoun's store; iron post stamped "806, Lexington".....	806.702
From Danville east along highway to Marksbury.	
Marksbury, in southwest corner of foundation of store and post office; aluminum tablet stamped "981 Lexington".....	981.175
From Shelby City along highway south to Milledgeville, thence east to Stanford.	
Milledgeville, in northeast corner of foundation of Moss Rus- sell's residence, on west side of pike, in heavy stone; aluminum tablet stamped "1035 Lexington".....	1,035.453
Stanford, in east of step of courthouse; aluminum tablet stamped "912 Lexington".....	912.495
From Milledgeville west 1.3 miles to Harris Creek. (Single- spur line.)	
Milledgeville, 1.3 miles west of, at forks of road, 30 feet from intersection, 15 feet from center of right fork leaving Milledgeville, in top of small rough rock; aluminum tablet stamped "1010 Lexington".....	1,010.157
From Stanford northeast along Louisville & Nashville R. R. to Lancaster, thence along highway north via Marksbury to Wilmore.	
Lancaster, in top step of front corridor of courthouse, north side; aluminum tablet stamped "1032 Lexington".....	1,032.216

From Lancaster southeast along highway to Sweeney. (Double-spur line.)	
Sweeney, 175 yards west of postoffice, west side of pike, near cut, on summit of hill, 3.5 feet above pike, in small bluff; aluminum tablet stamped "1023 Lexington".....	Feet 1,024.273
From Bryantsville east along highway to Bourne. (Single- spur line.)	
Bryantsville, opposite store at road west, in top of stepping block; aluminum tablet stamped "953".....	953.442
Bourne, at corner of road south, near famous Buckeye Cor- ner, in northeast corner of foundation of old stone build- ing; aluminum tablet stamped "928 Lexington".....	928.000
From High Bridge northeast along Cincinnati, New Orleans & Texas Pacific Ry. to Brannon.	
High Bridge, north end of bridge over Kentucky River, on coping stone of pier, west of track, 10 inches east of west edge; brass bolt (Coast and Geodetic Survey bench mark J-1)	763.883
Nicholasville, in east end of top stone step of courthouse; aluminum tablet stamped "947 Lexington." (This bench mark is on a single spur line.).....	947.935
Brannon, in table stone in front doorstep of stones at brick store near Cincinnati, New Orleans & Texas Pacific Ry.; aluminum tablet stamped "1041 Lexington"....	1,041.057
From Brannon along highway west via Mortonville to Salvisa, thence south along Southern Ry. to Harrodsburg.	
Pinckard, in west foundation of store at junction of Versailles and Lexington and Nicholasville and Lexington pikes; bronze tablet stamped "824 Lexington".....	824.140
Mortonville, in southwest corner of foundation of post office; bronze tablet stamped "789 Lexington".....	789.877
Salvisa, in south side of masonry of Masonic Lodge; bronze tablet stamped "808 Lexington".....	808.262
From Salvisa west along highway to Kirkwood. (Single- spur line.)	
Kirkwood, at northeast corner of store; iron post stamped "852 Lexington"	852.453

From McAfee west along highway to Mayo. (Single-spur line.)

McAfee station (Talmage), west side of track, 35 feet south of turnpike, near cattle guard, in stone in right of way; aluminum tablet stamped "821 Lexington"	Feet
Mayo, 16 feet northwest of steps of residence of Mr. Kelly, in circular part of stone wall; bronze tablet stamped "904 Lexington"	821.428
	904.555

ANDERSON, FAYETTE, FRANKLIN, HENRY, OWEN, AND
WOODFORD COUNTIES.

The elevations in the following list are based upon a line of precise leveling from Georgetown to Louisville.

The leveling in the Georgetown and Frankfort quadrangles was done in 1904, mostly by L. L. Lee, and was completed in 1906 by L. P. Hoover and F. H. West; that in Lockport, Owenton, and Sadieville quadrangle was done in 1906 by F. H. West.

From Benson via Lockport to Pleasant Home.

Benson, 4 miles northwest of, 1.2 miles south of old Tioga post office, on east side of Mt. Zion Pike, in west face of chimney of Mr. Allison's house; aluminum tablet stamped "857"	
	857.028

From Versailles along Southern Ry. west to Lawrenceburg, thence south to Salvisa.

Milner, 0.6 mile east of, in northeast corner of Griens Church; aluminum tablet stamped "894"	892.616
Tyrone, 125 feet southwest of station, 20 feet north of rail, 2 feet inside right of way fence, on property of W. H. Lillard; iron post stamped "737 Lexington"	737.560
Lawrenceburg, Anderson County courthouse, at north edge of west entrance step, in north sandstone head block; aluminum tablet stamped "788 Lexington"	788.078

From Lawrenceburg north along highway to Frankfort.

Alton, at northeast corner of junction of T roads, in west face of foundation of doctor's house; aluminum tablet stamped "839"	839.167
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Farmdale, on east side of Frankfort Pike, 300 feet south of Morris McCuen's store, in stone gate post; aluminum tablet stamped "849"	Feet
Frankfort, in extreme southwest corner of State Capitol grounds; iron post stamped "511 Lexington." (Loose in wet weather.)	849.154
	511.208

From Frankfort southeast along Louisville & Nashville R. to Spring Station.

Jetts, 100 feet southeast of, on west side of Louisville and Nashville R. R. in east foundation of mills; aluminum tablet stamped "791"	791.000
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From Benson north via Harper's Ferry to Pleasant Home.

Old Tioga post office, 1.6 miles north of, on south side of St. Johns pike, 300 feet east of junction of St. Johns and Mt. Zion pikes, old house facing St. Johns pike, front of chimney between wings; aluminum tablet stamped "912"	912.362
Lebanon Church, north face of foundation; aluminum tablet stamped "890"	889.550
Benson, 11.4 miles north of, junction of Bald Knob-Bailey's mill pike and Pleasantville-Flat Creek pike, at southeast corner of Edwin Bailey's house, north face of chimney; aluminum tablet stamped "906"	906.031
Harper's Ferry, 0.5 mile south of, on Harper's Ferry-Flat Creek pike, north side of road, in chimney in Mr. Hardings house; aluminum tablet	880.216
Harper's Ferry, 3.8 miles north of, 100 feet west of junction of Lockport and Portrifle Creek roads, Mrs. Lucy Hall's; aluminum tablet	612.366
Lockport, lock 3 feet from north end, west wall; aluminum tablet stamped "450"	450.131
Gratz, 0.5 mile south of, at Y roads, in corner of E. T. Thammori's yard; iron post stamped "496" (traverse station mark also)	495.842
Gratz, Joe Scott's house, north side, in east face of chimney; aluminum tablet stamped "484"	484.019

From Pleasant Grove east and south via Cedar Hill and Hesler to Walnut Grove.

Cedar Hill, H. W. Scott's house, northwest corner of foundation; aluminum tablet	897.791
Hallam, 0.8 mile south of, west side of Georgetown pike, stone chimney of James Taylor's house; aluminum tablet	939.816
Hesler, 0.1 mile north of Hesler's store, in stone foundation of J. O. Bannon's house; aluminum tablet	941.827

Walnut Grove, 2 miles north of, south side, east front of chimney of G. G. Gaines' house; aluminum tablet.....	Feet 942.865
Walnut Grove, north side of Indian Creek, in front of Jack Gaines' residence, in slab; aluminum tablet.....	687.363

From Walnut Grove west 13 miles to point south of Harper's Ferry.

Walnut Grove, 3.4 miles west of, 0.5 mile west of junction of Cedar and Indian creeks, east side of road, in chimney of Mr. Conway's house; aluminum tablet stamped "636" . . .	635.754
Junction of Bald Creek road and Ballards Landing-Monterey road, in foundation of S. J. Ballard's house; aluminum tablet stamped "499"	498.550

From Walnut Grove south via Harmony and Elmvile to Switzer.

Elmvile, east side of north face of R. B. Givin's house; aluminum tablet stamped "720"	719.690
Peaks Mill, 0.8 mile north of, in east abutment, south side, of bridge over Camp Pleasant Branch; aluminum tablet stamped "526"	525.442
Switzer, 3.2 miles north of, south side of abutment of bridge over Peaks Mill Creek, at Jackson's store; aluminum tablet stamped "542"	541.911

At Pleasant Home.

Pleasant Home, north side of Owenton-Clear Lick pike, in chimney of W. H. Lowdenbach's house; aluminum tablet stamped "888"	887.449
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Near Harmony.

Harmony, 0.5 mile south of; on Elmvile-Harmony road, south face of stone chimney in W. B. Watson's house; aluminum tablet stamped "717"	716.423
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NOTE.—Rerunning shows that the line between Walnut Grove and a point 9.7 miles south may be 2.5 feet in error. The first running has been accepted.

From Lexington along Southern Ry. west to Versailles, thence north to Midway, thence west to Spring Station.

Lexington, at northeast corner of South Broadway and Maxwell streets, at east stairway entrance to Dr. H. A. Phillips' drug store, in center of west end of door stone, brass bolt; lettered "U. S. C. & (-) G. S." (Coast and Geodetic Survey b. m.)	979.552
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Lexington, corner stone at southeast corner of Natural Science Building, State University; aluminum tablet stamped "984"	Feet 983.806
Lexington, county courthouse, in second stone step of Mill street or west entrance; aluminum tablet stamped "957" . . .	956.992
Elk Chester station, on Southern Ry., 75 feet west by 20 feet north of track; in southeast stone pillar of large warehouse; aluminum tablet stamped "841 Lexington"	841.286
Versailles, 400 feet west of station, crossing of Frankfort pike, southwest angle of, in lot of Belle Hunter; iron post stamped "923 Lexington"	923.238
Bonita, 1 mile west of, 3 miles north of Versailles, on Versailles-Midway pike, in large brick house of Mr. Geo. McLeod; aluminum tablet stamped "904.69"	904.729
Midway, northeast corner of post office; aluminum tablet stamped "820"	820.317
Spring Station, south face of stone, at northeast junction of railroad and pike crossing; aluminum tablet stamped "816"	815.774

From Lexington to Elk Chester Station.

Lexington, Broadway and Maxwell streets, 0.7 mile west of crossing of Louisville Southern R. R. and West High street; top of ear drum of southeast railroad gate holder . . .	956.122
Paynes, 1 mile east of station, in southeast corner of iron bridge over branch; lone bolt-head	888.174
Paynes Crossing, 1 mile west of, on north edge of railroad; point on top of large rock near cattle guard	909.311

BULLITT, JEFFERSON, SHELBY, AND SPENCER COUNTIES.

The elevations in the following list were determined by primary leveling extended from the precise-level line between Georgetown and Louisville, which crosses this quadrangle. Additional elevations will be found in list under precise leveling.

The leveling was done in 1910 by E. C. Bibbee.

From Long Run station south along highways to Waterford, thence west to Smithville.

Long Run station, 100 feet east of, north of track, at intersection of road with right of way; iron post stamped "629"	629.399
Long Run, 1 mile south of, on south end of stone culvert under wagon road; chiseled square, painted "734.2"	734.31

Clark station, 600 feet east of, on east end of culvert under pike, 12 feet north of railroad at road crossing; paint spot on large rock, painted "695.5".....	695.54
Clark, on north side of railroad, 100 feet northwest of station, at railroad crossing; iron post stamped "685".....	685.011
Clark, 0.7 mile south of, on east side of road; spike in top of large oak stump, painted "761.3".....	761.45
Clark, 1.6 miles south of, north side of T road north; bolt head in root of ash tree, painted "638.1".....	638.33
Wilsonville, 2.7 miles north of, on Louisville pike, at crossroads, on southwest corner; iron post stamped "600".....	600.561
Wilsonville, 1.9 miles northwest of, on Louisville pike, near southeast corner of church lot; iron bolt in root of large oak tree, painted "645.1".....	645.34
Wilsonville, 0.6 mile northwest of, on pike, top of rock milepost marked "L 22 T 10," painted "720.4".....	720.66
Wilsonville, southwest corner of R. H. Heady's yard, at intersection of Louisville-Taylorsville pike and Waterford pike; iron post stamped "642".....	642.631
Wilsonville, 0.9 mile south of, 25 feet south of small creek at ford; top of rock, painted "623.4".....	623.66
Wilsonville, 1.9 miles south of, south end of pike where road enters creek; chiseled square on rock, painted "598".....	600.84
Wilsonville, 3 miles south of, 480 feet south of north end of pike, in southeast corner of H. Jennings' garden; iron post stamped "591".....	591.682
Wilsonville, 4 miles south of, on east end of culvert under wagon road; chiseled square painted "564.6".....	564.95
Wilsonville, 5 miles south of, on west side of pike, opposite old ice house; chiseled square on rock, painted "555.6".....	555.98
Wilsonville, 6.4 miles south of, at T road near junction of Little Plum and Big Plum creeks; iron post stamped "513".....	513.683
Wilsonville, 7.4 miles south of, at T road east, on south abutment east side of small bridge; chiseled square painted "487.4".....	487.83
Waterford, on east side of pike, 200 feet north of junction of Waterford-Elk Creek pike; bolt head in top of stump of large sycamore tree painted "473.4".....	473.77
Waterford, at northwest corner of public schoolhouse; iron post stamped "468".....	468.28
Waterford, 0.8 mile west of, at T road east; bolt head in root of elm tree on east side of road painted "455.9".....	456.28
Waterford, 1.28 miles west of, on south side of public road; paint spot on top of large rock, painted "477.8".....	478.17
Waterford, 2.5 miles west of, on south side of public road, 25 feet east of T road east, at McGee ford over Salt River, 45 feet southwest of R. E. Cochran's residence; iron post stamped "455".....	455.731

Smithville, 2.4 miles east of; top of west end of iron culvert under road, painted "444.1".....	444.51
Smithville, 1 mile east of, on pike, south side of road at Y road; chiseled square on rock, painted "474.9".....	475.25

From Waterford east along highways to Taylorsville, thence south along highways to point about 2 miles northwest of Wakefield.

Waterford, 1.6 miles east of, on southwest corner of abutment of small bridge; chiseled square painted "565.6".....	566.03
Waterford, 3 miles east of, 15 feet west of Waterford-Taylorsville pike, 150 feet west of Elk Creek ford, in southeast corner of J. E. Dearmyers' yard; iron post stamped "522".....	522.534
Taylorsville, 2.4 miles west of, at private road south, on southwest corner of abutment of small bridge; chiseled square painted "496.6".....	496.98
Taylorsville, at southeast corner of courthouse, iron post stamped "Trav. Sta. No. 4, 489".....	489.642
Taylorsville, 1.1 miles south of, on pike at T road west, on large flat rock at west side of pike; chiseled square painted "695.0".....	695.43
Taylorsville, 2.1 miles south of, on pike, at northwest corner of T road; bolt head in root of walnut tree, painted "727.8".....	728.20

NOTE.—The above elevations are not adjusted, as there is an excessive error in the circuit in closing on the line from Smithville south and east to Wakefield.

BULLITT, NELSON, SPENCER, AND WASHINGTON COUNTIES.

The elevations in the following list were determined by a single unchecked spur line based on a triple checked spur line run from the bench mark at Mt. Washington to High Grove. A correction of 0.115 foot has been added to the elevation to agree with the adjusted elevation of the bench mark at High Grove. The closing error of minus 0.277 foot in the circuit based on the single unchecked spur line has not been distributed through the circuit.

The leveling was done in 1906 by F. H. West and E. P. Hoover.

From High Grove south along highways to Coxs Creek, thence easterly to Fairfield. (Single Unchecked line.)

High Grove, in chimney of W. T. McClure's house; aluminum tablet	Feet 498.947
Bardstown-Louisville pike, top of milepost "7 miles to Mt. Washington"	605.34
Mt. Washington, 8.2 miles south of, in foundation wall of W. B. Well's house; aluminum tablet.....	705.449
Mt. Washington, 10.8 miles south of, on Bardstown-Louisville pike, in corner of wall of Mrs. Lou Able's house; aluminum tablet	670.292
Mt. Washington, 11 miles south of, top of milepost marked "11 miles Mt. Wash."	703.454
Mt. Washington, 13 miles south of, on east side of Bardstown-Louisville pike, in doorstep of Oscar Manning's house; aluminum tablet	692.020
Coxs Creek post office, 1 mile east of, east side of Fairfield pike; on stone	650.01
Coxs Creek post office, 2.5 miles east of, on Fairfield pike, in front foundation of E. B. Well's house; aluminum tablet	735.625
Coxs Creek post office, 2 miles east of, on north side of Fairfield pike, in middle of T road; on rock.....	704.04
Fairfield, in foundation of C. I. Stewart's house; aluminum tablet	715.525

From Fairfield east along highways to Bloomfield, thence north to point 2.9 miles north of Wakefield, thence south to starting point. (A closed circuit based on a single unchecked spur line.)

Bloomfield, Louisville & Nashville R. R. bridge over Simpson Creek, southeast corner of abutment; aluminum tablet	640.811
Bloomfield, 2.8 miles north of, culvert over railroad track, 4 feet west of west track, north abutment, at northwest corner; aluminum tablet.....	715.811
Wakefield, 1 mile northwest of, at entrance of private roadway to Geo. W. Down's house, in rock culvert; aluminum tablet	681.415
On Little Union pike going west to Fairfield, 100 yards west of Lower Camp Branch school (16th district), south side of pike, nearest Simpson Creek, in rock; aluminum tablet	517.789
Bardstown pike, 3.3 miles southwest of, M. B. Allen's brick house on north side of Little Union pike, east side of chimney; aluminum tablet.....	767.322

From point 1 mile northwest of Wakefield along highway to a point 3.2 miles south of Taylorsville.

(The following elevation is not adjusted, as there is an error of 1 foot in closing on the line from Taylorsville run in 1910.)	Feet
Taylorsville, 3.2 miles south of, on Bloomfield pike, northwest side of road, on stone culvert; chiseled square, painted "743.8"	743.21

BULLITT, JEFFERSON, AND OLDHAM COUNTIES.

The elevations in the following list are based upon bench marks at Louisville and Westport, United States Corps of Engineers precise line, Ohio River Survey.

The leveling was done in 1905 by Fox Wood.

From Louisville from United States Engineers b. m. No. 10, on old guard gate, south to Fourth Street crossing Louisville & Nashville R. R. and return.

NOTE.—All elevations in the following list are determined by single-line offsets from main level lines.

Louisville, on old abutment, south side of canal, about Tenth street near west end of gate recess; north quadrant of circle (U. S. Corps of Engineers b. m. 10)	417.143
Louisville, edge of city, Ahren & Ott's Standard Sanitary Manufacturing Co., in northeast corner of factory building; aluminum tablet stamped "465, Adj., 1903." (Redetermined by precise leveling of 1906.)	465.074

From Louisville southwest along highway near Louisville & Nashville R. R. to Riverview, thence southeast to Shepherdsville.

Shively, junction of Seventh and Eighteenth street roads, in St. Helen's Church; aluminum tablet stamped "458, Adj., 1903"	458.246
Valley station, 1 mile west of, in front doorsill of Bethany Church; aluminum tablet stamped "452, Adj., 1903"	452.365
Barralton, 1.5 miles southwest of, in R. D. Snellens' yard, on Riverview-Shepherdsville road; iron post stamped "Prim. Trav. Sta. No. 33, 483, Adj., 1903"	482.802

From Riverview southwest to West Point. (Single spur line.)

West Point, Kentucky and Indiana Bank building; aluminum tablet stamped "441, Adj., 1903".....	Feet 441.204
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From Gap in Knob south to Shepherdsville.

NOTE.—This elevation was determined by a single-line offset from a main level line.

Shepherdsville, in northwest corner of courthouse yard; iron post stamped "Prim. Trav. Sta. No. 32, 445, Adj., 1903".....	445.589
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From Louisville along highway south to Gap in Knob, thence east to Mount Washington, thence north to Jeffersontown.

NOTE.—All elevations in the following list, except at Gap in Knob and Brooks Station, are determined by single-line offsets from main level lines.

South Park, 60 feet south of station, in rock in corner of fence; aluminum tablet stamped "Prim. Trav. Sta. No. 31, 478, Adj., 1903".....	478.407
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Brooks, 0.25 mile north of station, between mileposts 12 and 13, in east end of stone culvert; aluminum tablet stamped "513, Adj., 1903".....	513.698
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Gap in Knob, 100 yards north of station, west of railroad, in stone culvert; aluminum tablet stamped "493, Adj., 1903".....	493.332
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Pleasant Grove Schoolhouse, 200 feet south of, 50 feet from front of R. L. Smith's residence, north of Shepherdsville and Mount Washington roads, in large flat stone; aluminum tablet stamped "577, Adj., 1903".....	576.844
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Shepherdsville, 6 miles east of, on Shepherdsville and Mount Washington roads, south side of road; iron post stamped "651, Adj., 1903 Prim. Trav. Sta.".....	651.263
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Mount Washington, in corner of Peoples Bank building; aluminum tablet stamped "688, Adj., 1903".....	688.678
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Mount Washington, 2 miles north of, on Bardstown Pike, east side of bridge across Floyds Fork, in south abutment; aluminum tablet stamped "487, Adj., 1903".....	487.507
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Fairmount, on Bardstown pike, 15 miles from Louisville, in southeast corner of Fairmount Church; aluminum tablet stamped "717, Adj., 1903".....	717.259
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From Jeffersontown west along Southern Ry. to Fourth street crossing in Louisville.

Jeffersontown, in Jefferson Bank; aluminum tablet stamped "711, Adj., 1903".....	711.561
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Burchel, 1.1 miles north of station, on Bardstown pike, in stone bridge across Bear Grass Creek; aluminum tablet stamped "484, Adj., 1903".....	483.903
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Louisville, Preston street pike, in concrete abutment of Southern Ry. bridge over pike; aluminum tablet stamped "512, Adj., 1903".....	Feet 511.952
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From Jeffersontown along highway north to Anchorage.

Middletown, corner of Anchorage and Shelbyville pikes, in brick church; aluminum tablet stamped "722, Adj., 1903"....	721.872
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From Mount Washington south to Smithville.

Smithville, corner of yard behind Fairbanks scales; iron post	488.014
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From Anchorage north along highway to Goshen, thence northeast to Westport.

NOTE.—All elevations in the following list are determined by single-line offsets from main level lines.

Anchorage, in circular park, about 300 feet northwest of clubhouse, 62 feet southwest of track; iron post stamped "Prim. Trav. Sta. No. 38, 724, Adj., 1903".....	724.264
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Worthington, in Cambellite Church; aluminum tablet stamped "694, Adj., 1903".....	694.848
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Goshen, in Presbyterian Church; aluminum tablet stamped "699, Adj., 1903".....	699.241
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Skylight, 0.1 mile west of, on west side of road nearly opposite house on east side, in ledge of rock; aluminum tablet stamped "704, Adj., 1903".....	704.041
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At Westport.

NOTE.—These elevations are determined by single-line offsets from main level lines.

Westport, northeast corner of public-school grounds; iron post stamped "Prim. Trav. Sta. No. 40, 486, Adj., 1903".....	486.727
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Westport, 350 feet north of road to Ohio River, in root on south side of pine tree; spike (U. S. Corps of Engineers b. m. 577 A).....	446.514
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BOONE AND KENTON COUNTIES.

The elevations in the following list are based on the bench mark "T" at Cincinnati, established by the Coast and Geodetic Survey, consisting of a copper-bolt projection fixed in the west side of the courthouse, on the

north side of the south door, about 2 feet above pavement, the elevation of which is now accepted as 546.537 feet. (Refer to Bulletins 411 and 476 for additional elevations in Ohio in these quadrangles.)

The leveling was done in 1898 by Ralph Stewart.

At Fort Thomas.

Fort Thomas, east side of foundation of tower; aluminum tablet stamped "852, Cin".....	Feet 851.577
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From Florence to point near Covington.

Florence, southwest corner of intersection of Burlington and Lexington pikes, southeast corner coping of foundation of red brick building; aluminum tablet stamped "936, Cin" ..	935.191
Burlington, near northwest corner of foundation of courthouse; aluminum tablet stamped "848, Cin".....	847.386
Covington, 1.5 miles southwest of, on Lexington pike, 20 feet east of northwest corner, in coping stone of foundation; aluminum tablet stamped "894, Cin".....	893.115

BUTLER, LOGAN, MUHLENBERG, TODD, AND WARREN COUNTIES.

The elevations in the following list are based on elevations of bench marks in adjoining quadrangles.

The leveling was done in 1911 by E. C. Bibbee.

From Drakesboro along highway east to Rochester, thence south to point 4 miles south of Quality.

Drakesboro, inside picket fence, 3 feet north of northeast corner of police station at cross street, 50 feet east of railroad; aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1908, 398 Ky.".....	398.066
Browder, railroad crossing near station; top of rail	419.2
Browder, 0.8 mile east of, 20 feet south of large barn at Y road; highest point on limestone rock on north side of road	427.53
Browder, 1.4 miles east of, at southwest corner of T road south, 1,000 feet west of Garley Ryan's residence; iron post stamped "419, Ky.".....	419.260
Ennis, 0.8 mile west of, on corner stone rock 18 inches above ground in center of road at T road south; chiseled square	446.33

Ennis, in northeast corner of J. Canfield's yard, 61 feet south of gin store; iron post stamped "458, Ky.".....	Feet 458.048
Ennis, 0.9 mile east of, in front of William Knight's blacksmith shop and store; bolthead in top of white-oak stump	451.88
Ennis, 2.1 miles east of, on south side of road, 25 feet east of Y road south, 200 feet east of Quinn Fleming's residence; iron post stamped "464, Ky."	464.685
Ennis, 2.7 miles east of, 25 feet east of T road north, 300 feet east of Jacob Robison's residence; bolthead in top of white-oak stump in road, on south side.....	470.48
Rochester, southeast edge of, on Morgantown-Rochester road, at crossroads, in northwest corner of front yard of J. A. Marvin's residence; iron post stamped "Prim. Trav. Sta. No. 17, 1907, 450, Ky.".....	450.610
Rochester, 1.9 miles south of, on north side of road, 100 feet west of intersection of Morgantown-Rochester road with Rochester-Russellville road; bolthead in south root of black-oak tree	487.55
Huntsville, 0.8 mile north of, on west side of road, at crest of hill, 500 feet south of Miffords Branch (creek); chiseled square on large sandstone rock	479.63
Huntsville, in southeast corner of front yard of Henry Vaughan's house, in northwest corner of crossroads; iron post stamped "548, Ky.".....	548.240
Huntsville, 1.2 miles south of, on south side of road opposite residence of R. E. Brown; bolthead in root of hickory tree	419.80
Huntsville, 2 miles south of, on west side of road, 265 feet south of Deer Lick Creek, about 500 feet south of G. W. Brown's residence; chiseled square on limestone ledge...	443.48
Huntsville, 2.7 miles south of, on east side of road near crest of large hill; highest point on large conglomerate rock	555.76
Huntsville, 3.8 miles south of, at forks of road, in northwest corner of Mt. Zion schoolhouse yard; iron post stamped "597, Ky."	597.002
Quality, 1.6 miles north of, on west end of approach to small bridge over creek, at north side; chiseled square.....	424.60
Quality, 0.7 mile north of, 200 feet south of crest of hill, 8 feet west of wagon road; chiseled square on large red sandstone rock	617.40
Quality, 60 feet north of postoffice, at T road west; in northeast corner of John Harper's front yard; iron post stamped "503, Ky."	503.470
Quality, 0.4 mile south of, on east side of road, 35 feet south of lane leading to John Fellow's residence; highest point on white marble gravestone under fence.....	481.03

Quality, 1.4 miles south of, on north end of retaining wall, at east side, 9 feet north of northeast corner of small bridge; chiseled square	Feet 451.18
Quality, 2.4 miles south of, on south abutment of bridge over Delhams Creek, at west side; chiseled square.....	451.21
Quality, 4 miles south of, on north side of road, 430 feet east of ford over Delhams Creek, 0.7 mile west of Mt. Zion negro church and schoolhouse; chiseled square on limestone ledge	485.75

From Diamond Springs north along Louisville & Nashville
R. R. to Penrod.

Diamond Springs, in front of hotel, 5 feet north of road, 55 feet north of bridge across creek; copper nail in root of beech tree	429.13
Diamond Springs, 0.3 mile west of post office, at cross-roads, on south end of bridge abutment, at east side; chiseled square on coping stone.....	412.89
Diamond Springs, 150 feet west of post office, on railroad right of way, at road crossing; iron post stamped "424, Ky."	424.004
Dunmore, in east face of northeast corner of Farmers' Bank Building; aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1908, 593, Ky."	592.982
Dunmore, 1.6 miles north of, 11 feet west of railroad, 20 feet east of public road; copper nail in top of post.....	495.73
Penrod, 40 feet north of post office, on railroad right of way, 25 feet west of main track; iron post stamped "427" ..	427.265

From point 4 miles south of Quality southwest to Lewisburg,
thence north along Louisville & Nashville R. R. to
Diamond Springs. (Portion of line.)

Lewisburg, 6.1 miles east of, on north side of road at crest of hill; chiseled square on limestone ledge.....	550.77
Lewisburg, 5.1 miles east of, on north side of road, 1 foot south of fence; bolthead in top of white-oak stump.....	551.15
Lewisburg, 3.7 miles east of, in forks of road, 120 feet east of negro cabin; iron post stamped "497, Ky.".....	497.474
Lewisburg, 3.5 miles east of, on south side of road at T road south; chiseled square on limestone ledge.....	464.78
Lewisburg, 1.6 miles north of, on north end of trestle over Mud River (Bridge No. 33), at east side; first drift bolthead	421.77
Diamond Springs, 150 feet west of post office, on railroad right of way, at railroad crossing; iron post stamped "424, Ky."	424.004

From point 2 miles south of Rochester east along highway to
point 1.4 miles east of Dunbar.

Rochester, 2.9 miles southeast of, on Rochester-Morgantown road, on south side, 200 feet west of T road north, 60 feet west of A. Jenkinson's residence; iron post stamped "554, Ky."	Feet 553.938
Rochester, 4.1 miles southwest of, on south side of road, near small bridge; chiseled square on rock.....	438.93
South Hill, 0.6 mile west of, in southeast corner of cross-roads; bolthead in root of white-oak tree, painted.....	472.21
South Hill, 100 feet west of post office, opposite T road south; iron post stamped "546, Ky.".....	546.340
South Hill, 0.2 mile east of, 20 feet south of public road, 7 feet north of drive to M. E. Church (log); nailhead in root of black-oak tree	519.19
South Hill, 1.2 miles east of, 7 feet south of wagon road; bolthead in root of 2-foot white-oak tree.....	459.46
Dunbar, northeast corner of Baptist Church, 28.1 feet west of post office; iron post stamped "466, Ky.".....	466.61
Dunbar, 1.4 miles east of, on southeast corner of T road south; bolthead in root of black-oak tree.....	454.90

From point near Pauline west to point 4 miles south of
Quality.

Pauline, 1.6 miles north of, in center of road on Logan-Butler County line; bolthead in root of oak tree about 4 feet in diameter.....	533.05
Pauline, 40 feet southeast of southeast corner of post office building; highest point on limestone rock.....	570.72
Costelow, 1.5 miles north of, 0.8 mile south of Pineville, 35 feet west of small stream, 80 feet south of Mass blacksmith shop, on east side of road opposite junction; iron post stamped "Prim. Trav. Sta. No. 9, 1909, 496, Ky." ..	496.775
Mass blacksmith shop, 1.6 miles west of, on south side of road, 90 feet west of old barn; highest point on limestone rock	467.73
Anderson, 1.2 miles east of, in forks of road opposite residence of Monroe Belcher; bolthead in root of black-oak tree	581.01
Anderson, at southwest corner of T road south, 800 feet north of post office, 250 feet west of church, 2 feet northwest of northwest corner of old blacksmith shop; iron post stamped "637, Ky.".....	637.168
Anderson, 0.8 mile west of, 11 feet south of center of public road; bolthead in top of 28-inch white-oak stump.....	540.89

Anderson, 2.3 miles west of, on south side of public road, 4 feet east of wheel track, about 1,200 feet northwest of Gum Springs schoolhouse; bolthead in root of 2-foot hickory tree	Feet 555.19
Zion Baptist Church (negro), at southeast corner of, 300 feet northeast of forks of road; iron post stamped "Prim. Trav. Sta. No. 10, 1909, 594, Ky."	594.150
Quality, 4 miles south of, on north side of road, 430 feet east of ford over Delhams Creek, 0.7 mile west of negro church and schoolhouse; chiseled square on limestone ledge. . . .	485.75

From point near Dunbar along highway east to Morgantown, thence northwest to Logansport.

Morgantown, 3.3 miles west of, in forks of Morgantown and Mining City roads, 275 feet east of Pleasant Rock Church; iron post stamped "614, Ky."	614.479
Morgantown, 2.9 miles west of, on south side of road; chiseled square on sandstone ledge	518.67
Morgantown, 1.5 miles southwest of, at northeast corner of small bridge over creek; chiseled square on stone	421.62
Morgantown, in northwest corner of courthouse yard; iron post stamped "573, Ky."	573.129
Morgantown, 1.6 miles northwest of, on south side of road near large barn; nailhead in root of white-oak tree	508.56
Morgantown, 2 miles northwest of, at forks of road at southwest corner of yard; bolthead in root of sassafras tree	647.08
Morgantown, 2.9 miles northwest of, in front yard of High Hill schoolhouse, 21 feet north of public road; iron post stamped "635, Ky."	635.266
Morgantown, 4.2 miles northwest of, on south side of road; highest point on large conglomerate rock	556.33

From Morgantown south along highway to Pauline.

Morgantown, 1.8 miles south of, on west side of road, 100 feet north of bottom of steep hill; chiseled square on sandstone ledge	453.35
Morgantown, 2.8 miles south of, at forks of Morgantown-Russellville and Morgantown-Bowling Green roads; iron post stamped "428, Ky."	428.822
Davenport, at southeast corner of Robert Smith's gin store; chiseled square on foundation stone	460.55
Davenport, 1 mile southwest of, on north side of road, in center of T road north; bolthead in top of white-oak stump 3 feet in diameter	688.18
Dimple, 2.8 miles north of, 1,800 feet north of church, in center of triangle, at junction of roads; iron post stamped "Prim. Trav. Sta. No. 12, 1909, 597, Ky."	597.373

Dimple, 1.8 miles north of, on east side of road, at private road crossing; bolthead in root of black-oak tree 2 feet in diameter	Feet 597.20
Dimple post office, 700 feet south of, on east side of road near the southeast corner of T road east; bolthead in root of poplar tree 18 inches in diameter	467.56
Dimple, 0.8 mile south of, at building known as Brick House in southwest corner of crossroads; iron post stamped "511, Ky."	510.989
Dimple, 1.8 miles south of, on south side of road, on crest of hill opposite negro church and schoolhouse; bolthead in root of white-oak tree 16 inches in diameter	603.08
Flatrock, 0.2 mile north of, in fork of Morgantown-Russellville and Rochester-Russellville roads; chiseled square on limestone	548.92
Davis Crossroads, at northeast corner of intersection of Russellville-Greenville and Bowling Green-Greenville roads, 75 feet west of Geo. Davis' house; iron post stamped "634, Ky."	634.394

From Davis Crossroads southeast about 4 miles to point 0.8 mile northwest of Cave Hill, thence north and west along highways via Johnson's store to Morgantown.

Davis Crossroads, 1.45 miles southeast of, at forks of road north; nailhead in top of 30-inch white-oak stump	689.19
Cave Hill, 2.9 miles northwest of, on east side of road, opposite residence of John Marlin; nail in root of white-oak tree	717.57
Cave Hill, 1.7 miles north of, 60 feet south of residence of Dick Bailey, 300 feet north of T road west, on west side of road, in limestone ledge; aluminum tablet stamped "613, Kentucky"	612.875
Cave Hill, 0.8 mile north of, in front of residence of James Thompson; chiseled square on step	624.30
Cave Hill, 1.5 miles northeast of, on south side of road at T road east; nail head in root of elm tree	619.90
Cave Hill, 2.5 miles northeast of, on north side of road at private lane north 10 feet south of property line; nailhead in top of white-oak stump	645.01
Cave Hill, 3 miles northwest of, 1.2 miles north of Cohron post office, in corner of yard at southwest corner of T road south; iron post stamped "662, Kentucky"	662.346
Hadley, 1.8 miles west of, 20 feet south of road, near southeast corner of T road south; nailhead in root of maple tree	462.85
Hadley, 0.8 mile west of, on north side of road; chiseled square on sandstone rock	639.78
Hadley, 125 feet east of post office, in northeast corner of Dr. Bush's yard; iron post stamped "659, Kentucky"	658.824

Rockland, 1.6 miles west of, on south side of road at Y road; bolthead in root of beech tree.....	Feet 641.86
Rockland, 1,200 feet north of post office, on top of hill, in front of Cole's store, at southwest corner of T road west; iron post stamped "665, Kentucky".....	665.028
Rockland, 1.3 miles north of, at northeast corner of T road east; chiseled square on stone in retaining wall.....	484.16
Rockland, 1.6 miles north of, on west side of wheel guard of iron bridge over Clifty Creek; second bolthead from south end	414.19
Rockland, 2.4 miles north of, in southwest corner of Bennett Chapel; iron post stamped "519, Kentucky".....	519.337
Rockland, 3.2 miles northwest of, 400 feet north of ford over Maxey Creek, on east side of road; chiseled square on sandstone rock	419.10
Little Muddy, 2.6 miles southeast of, on north side of road, near property line at private lane west; nailhead in root of elm tree	471.9
Little Muddy, 2.1 miles southeast of, on south side of public road, near Warren-Butler county line, 600 feet north of A. C. Chapman's residence; iron post stamped "458, Kentucky".....	458.095
Little Muddy, 1 mile southeast of, on east property line in front of residence of C. R. Wiley; bolthead in root of elm tree	469.38
Little Muddy, 0.2 mile south of, at southeast corner of T road east; chiseled square on curbstone of well.....	453.15
Little Muddy, 300 feet south of post office, in northeast corner of C. M. Cole's garden; iron post stamped "468, Kentucky" ..	467.793
Woodbury, 2.25 miles south of, on northwest corner of bridge over Little Muddy Creek; first bolthead in wagon guard....	409.35
Woodbury, about 0.5 mile east of, 175 feet southeast of junction of Barren and Green rivers, on property line on south side of public road, in front of ferryman's residence; iron post stamped "412, Kentucky"	411.727
Johnson's Store, 0.9 mile south of, 100 feet northwest of Leonard Oak schoolhouse, on south side of road; chiseled square on sandstone rock	642.19
Johnson's Store, 30 feet north of, in northeast corner of garden, at Y road; iron post stamped "647, Kentucky".....	646.860
Johnson's Store, 0.8 mile northwest of, on south side of road near old house; chiseled square on large rock.....	604.35
Morgantown, 1.4 miles north of, at west end of large iron bridge over Welsh Creek in Green River bottoms, on north side; chiseled square on retaining wall.....	409.18
Morgantown, in northwest corner of courthouse yard; iron post stamped "573, Kentucky".....	573.129

From point near Cave Hill southwest along highways to Gasper Ford.

Cave Hill, 4 feet north of northeast corner of porch to post office; chiseled square on limestone rock.	Feet 659.60
New Gasper Church, 1,500 feet south of, at corner of wire fence, 20 feet north of crossroads, about 1.5 miles north of Galloway's mill; iron post stamped "Prim. Trav. Sta. No. 8, 1909, 676, Kentucky"	676.021
Cave Hill, about 3½ miles southeast of, on west bank of Gasper River, at Gasper Ford; bolthead in root of elm tree	456.54

From point 7 miles south of Greencastle north along highways to point 1.5 miles south of Greencastle.

Greencastle, 7 miles south of, in forks of road; bolthead in root of 20-inch black-oak tree	763.93
Greencastle, 5.6 miles south of, on north side of road, in corner of field at T road south, 300 feet northeast to residence of Grunda Davison; iron post stamped "740, Kentucky"	740.751
Greencastle, 4.8 miles south of, 150 feet north of John Westbrook's residence, at northeast corner of T road west; bolthead in root of black-oak tree	720.62
Greencastle, 3.4 miles south of, in forks of pike, 0.4 mile north of Barren River Church; iron post stamped "669, Kentucky"	668.835
Greencastle, 2.7 miles south of, on west side of road, in front of house, 55 feet north of T road west; bolthead in root of cedar tree.....	584.21
Greencastle, 1.5 miles south of, 15 feet east of center of pike; chiseled square on brown limestone rock	490.41

From point 2.7 miles west of Vineyard west along highways to Johnson's Store.

Vineyard, 2.7 miles west of, 37 feet west of intersection of Y roads; bolthead in root of hickory stump.	638.51
Vineyard, 5.1 miles west of, at southeast corner of Cedar Grove schoolhouse yard; iron post stamped "642, Kentucky"	642.664
Johnson's Store, 1.8 miles northeast of, on west side of road, 200 feet south of Y road; bolthead in top of 24-inch black-oak stump	707.66
Johnson's Store, 30 feet north of, in northeast corner of garden at Y road; iron post stamped "647, Kentucky"	646.860

From Greencastle north along highways via Threlkel to Vineyard, thence west to Minnie Grove.

Greencastle, 80 feet south of post office, in corner of field, 2 feet west by 2 feet north of property corner; iron post stamped "424, Kentucky".....	424.397
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Greencastle, 1 mile north of, 300 feet southwest of T. Miller's residence; chiseled square on limestone rock.....	Feet 444.40
Richardsville, at residence of Dr. Struthers, opposite post office, on foundation of retaining wall of yard; chiseled square	686.15
Richardsville, 1 mile north of, 25 feet west of north-south road, at corner of fence; iron post stamped "Prim. Trav. Sta. No. 6, 1909, 560, Kentucky".....	560.332
Richardsville, 1.9 miles north of, on west side of road, near property line; chiseled square on limestone ledge.....	559.75
Richardsville, 3 miles north of, at southeast corner of T road east; bolthead in top of post.....	576.23
Long, 2 feet south of southeast corner of post office; iron post stamped "618, Kentucky".....	618.332
Threlkel, 1.8 miles south of, 20 feet north of intersection of Y roads, on ridge; bolthead in root of black-oak tree.....	660.56
Threlkel, 100 feet southwest of post office, at northeast corner of dwelling; iron post stamped "429, Kentucky".....	429.597
Threlkel, 0.8 mile north of, in forks of road, 700 feet south of New Bethany Church; bolthead in root of sycamore tree	611.24
Threlkel, 2 miles north of, 15 feet east of center of public road; chiseled square on northwest corner of foundation of Silas Phelps' store	430.14
Vineyard, 1.3 miles south of, in northwest corner of P. C. Smith's garden, 25 feet east of center of public road; iron post stamped "430, Kentucky".....	429.978
Vineyard, 0.2 mile east of, 26 feet west of southeast corner of T road west; chiseled square on sandstone rock.....	444.15
Vineyard, 1 mile west of, on south side of road, at second-class road south; bolthead in top of 12-inch black-oak stump 3 feet above ground.	525.74
Vineyard, 1.7 miles west of, 100 feet south of Whillinghill store, in northeast corner of yard in forks of road, known as "Minnie Grove"; iron post stamped "629, Kentucky".....	628.937
From point 4.4 miles west of Kuykindall's store east to same, thence 0.6 mile north to crossroads.	
Kuykindall's store, 4.4 miles west of, on south side of road at forks, 0.6 mile east of Gasper Ford; iron post stamped "513, Kentucky"	513.711
Kuykindall's store, 3.1 miles west of, on north side of road, 75 feet east of negro cabin; chiseled square on limestone rock in ledge	520.52
Kuykindall's store, 1.5 miles west of, in forks of road, on top of hill, 100 feet north of C. W. Cooper's gin store; bolthead in root of black-oak tree.....	749.61

Kuykindall's store, 5 miles northwest of Bowling Green, 10 feet south of southeast corner of W. E. Kuykindall's store, 40 feet west of junction of pikes; iron post stamped "Prim. Trav. Sta. No. 7, 543, Kentucky, 1909".....	Feet 543.055
Bowling Green, 4.4 miles northwest of, 0.6 mile west of Kuykindall's store, 4 feet south of south wheel track, 20 feet southwest to twin cedar at crossroads; chiseled square on limestone rock	665.92

Elevations at and near Lewisburg.

Lewisburg, 2.7 miles east of, on southeast corner of retaining wall to approach of Sutton's bridge over Mud River; chiseled square	428.36
Lewisburg, 1.8 miles east of, at southeast corner of crossroads, 1,300 feet east of forks of Lewisburg-Rochester and Lewisburg-Morgantown roads; iron post stamped "476, Ky."	475.665
Lewisburg, 500 feet northwest of station, north side of road, in southeast corner of front yard of Arnold Hotel, 180 feet west of Louisville & Nashville R. R.; iron post stamped "Prim. Trav. Sta. No. 11, 496, Ky., 1909"	496.214
Lewisburg, 0.5 mile north of, on limestone ledge on west side of Louisville & Nashville R. R., oposite milepost; chiseled square marked "L 155 O 50"	472.63

Elevations at and near Clifty.

Clifty, in front of Baptist and Christian Church, on east side of road; iron post stamped "805, Ky.".....	804.858
Clifty, 1.2 miles west of, 6 feet south of public road, opposite T road north; copper nail in root of hickory tree....	807.98
Clifty, 2 miles west of, in front of residence of J. S. Wallis; copper nail in root of black-oak tree.....	815.08

From Depoy east along Illinois Central R. R. 1 mile, thence south along highway to Bancroft.

Depoy, 0.9 mile east of Illinois Central R. R. station, inside right of way, about 60 feet to center of road crossing over railroad tracks; iron post stamped "507".....	506.907
Depoy, about 3.5 miles southeast of, 75 feet to center of road, north side, 80 feet east of white-oak tree; iron post stamped "545"	544.841
Bancroft, about 1.2 miles east of, on south side of road at T road north; spike in top of stump.....	496.97
Bancroft, about 0.8 mile east of, on south side of road, 15 feet to center; top of stone	538.48
Bancroft, 75 feet west of Harris & Co.'s store, 20 feet west of center of road; iron post stamped "485".....	485.567

From point near Depoy east along road to Drakesboro, thence northwest along Louisville & Nashville R. R. to Cleaton.

	Feet
Greenville, 0.7 mile west of, on north side of road, at intersection of Greenville-Darkmansville road with Greenville-Depoy road; nail in root of wild-cherry tree.....	565.07
Greenville City Hall, in southwest corner of foundation; aluminum tablet stamped "538".....	538.406
Greenville, 1.1 miles east of, 45 feet east of first bridge, 6 feet north of wagon road; copper nail in top of white-oak stump	425.00
Greenville, 2.6 miles east of, at T road south; copper nail in top of white-oak corner post	427.52
Greenville, 2.6 miles east of, at southwest corner of T road south; iron post stamped "423".....	423.815
Greenville, 3.6 miles east of, on north side of road, at private road south, 400 feet east of creek; copper nail in top of white-oak post.....	410.77
Greenville, 4.6 miles east of, on north side of wagon road, 40 feet west of bridge over Pond creek, at T road south; chiseled square on large sandstone rock.....	402.92
Greenville, 6.1 miles east of, at northwest corner of Ebenezer Church, 125 feet southeast of crossroads; iron post stamped "535"	535.705
Drakesboro, 1.5 miles west of, in southwest corner of T road south; copper nail in root of black-oak tree	503.55
Drakesboro, inside picket fence, 3 feet north of northwest corner of police station, at cross streets, 50 feet east of railroad; aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1908, 398"	398.056
Elk Valley station, 15 feet east of railroad track, in southwest corner of foundation of telephone booth; copper nail	406.31
Bevier, 3 miles south of, 7 feet east of railroad, 17 feet north of railroad crossing; chiseled square on stone.....	408.24
Cleaton station, 90 feet east of, at southeast corner of culvert, in bottom stone; aluminum tablet stamped "444"	443.083

From Greenville south along road to Kirkmansville, thence west to county line.

Greenville, 1.8 miles southwest of, on east side of road, 25 feet southwest of old coal mine; copper nail in root of white-oak tree	477.28
Greenville, 2.6 miles southwest of, on south side of public road, 25 feet east of Y road; copper nail in root of black-oak tree	608.95

	Feet
Greenville, 3.2 miles southwest of, at northeast corner of T road, 900 feet west of Friendship Church and schoolhouse, in southwest corner of Francis Miles' yard; iron post stamped "579"	579.357
Greenville, 3.8 miles southwest of, at northeast corner of bridge over Pond Creek; chiseled square on large flat rock	451.62
Greenville, 5 miles southwest of, on west side of road opposite residence of W. H. Metzker; copper nailhead in top of white-oak stump.....	561.56
Greenville, 5.6 miles southwest of, on Wier road, 12 feet west of center of public road, at south corner of W. G. Lee's garden; copper nailhead in root of twin oak tree	572.28
Wier, in front yard of residence of F. K. Jameson, 45 feet from southeast corner of dwelling, 78 feet from southeast corner of general store and post office, in sandstone; aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1908, 628"	629.204
Wier, 1.2 miles southwest of, on Kirkmansville road, 15 feet east from center of wagon road; copper nail in top of white oak stump 10 feet in circumference.....	455.63
Wier, 2 miles south of, at north end of bridge over Long Run, on east wing; chiseled square.....	429.36
Wier, 3.5 miles south of, in front of Long Star Church; iron post stamped "607".....	607.145
Wier, 4.9 miles south of, on west side of road, 1,200 feet north of crossway ford, 100 feet south of T road; copper nail in root of sycamore tree.....	421.23
Wier, 6.4 miles south of, east side of iron bridge over Pond River; chiseled square on north abutment.....	426.73
Wier, 7.9 miles south of, on west side of road, 150 feet north of T road, 5.3 miles south of iron bridge over Pond River; iron post stamped "464".....	463.834
Kirkmansville, 2.4 miles north of, 9 feet west of center of road at small stream crossing; chiseled square on limestone rock	439.21
Kirkmansville, 0.6 mile north of, 10 feet west of center of public road; copper nail in root of elm tree.....	438.61
Kirkmansville, 900 feet north of center of town, on west side of Greenville-Kirkmansville road, 200 feet north of crest of hill, in sandstone ledge; aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1908, 475".....	475.515

From Greenville southeast along road to Clifty, thence west to Kirkmansville.

Greenville, in southwest corner of foundation of courthouse; aluminum tablet stamped "538, Ky.".....	538.406
Greenville, 1 mile south of, 17 feet north of center of public road, on top of hill; copper nail in root of white-oak tree.....	571.09

Greenville, 2.7 miles south of, on Elkton road, in front of Pleasant Hill Church; iron post stamped "536, Ky."	Feet 536.742
Greenville, 5.3 miles south of, on east side of building in north fork of Elkton road; chiseled square in foundation stone	417.00
Greenville, 5.3 miles south of, in north fork of upper and lower Elkton roads, on east side of store; iron post	417.317
Greenville, 6 miles south of, on lower Elkton road, in northeast corner of Carters Creek Church lot, 25 feet east of center of road; copper nail in top of black-oak stump. . .	561.45
Greenville, 6.7 miles south of, on lower Elkton road, on east side of road; copper nail in top of black-oak stump. . .	525.42
Greenville, 8.4 miles south of, 2.5 miles west of Rosewood and Cisley post office, at southeast corner of T road; iron post stamped "495, Ky."	495.044
Greenville, 9.5 miles south of, 10 feet east of center of road, 75 feet northeast of R. J. Jenkins' store; copper nail in root of black-oak tree.	602.27
Greenville, 11.1 miles south of, on lower Elkton road, 35 feet north of northeast corner of crossroads; copper nail in root of walnut tree.	686.63
Greenville, 11.6 miles south of on lower Elkton road, in foundation stone of north chimney on west side of N. A. Shults' residence; aluminum tablet stamped "725, Ky."	725.169
Greenville, 12.4 miles south of, 11 feet east of public road, in front of residence of Elard Gragery; chiseled square in sandstone retaining wall.	736.67
Greenville, 13.1 miles south of, on lower Elkton road, at the northwest corner of New Harmony schoolhouse and church yard; copper nail in root of hickory tree.	682.15
Greenville, 13.8 miles south of, on lower Elkton road, 7 feet north of center of public road; copper nail in top of 36-inch white-oak stump	697.44
Greenville, 14.7 miles south of, on lower Elkton road, at northeast corner of T road east; chiseled square on stone	750.41
Clifty, 3.7 miles west of, opposite residence of C. J. Mansfield on west side of road, 150 feet east of small cemetery; iron post stamped "492, Ky."	492.053
Kirkmansville, 1.6 miles west of, in front of residence of J. R. Heltsley, 100 feet west of public road; chiseled square on top of limestone rock	466.24

From point near Clifty east along road to Diamond Springs
thence north along Louisville & Nashville
R. R. to Drakesboro.

Clifty, 2.5 miles northeast of, 15 feet east of intersection of road forks, 700 feet east of large barn of Marvin McElvin, in stone post; aluminum tablet stamped "Prim. Trav. Sta. No. 7, 790"	Feet 790.792
Clifty, 3.2 miles east of, on Deerlick road, 35 feet south of crest of hill in front of residence of Clyde Powell; copper nail in root of 12-inch black-oak tree.	763.59
Clifty, 4.2 miles east of, opposite T road south, 100 feet south of McElvin cemetery; iron post stamped "707, Ky."	707.199
Deerlick, 2.8 miles west of, on north side of road at T road north; copper nail in root of cedar tree.	688.49
Deerlick, 1.5 miles west of, at northeast corner of T road south; copper nail in root of sycamore tree.	713.79
Deerlick, 1 mile west of, 15 feet north of public road at T road south, 85 feet southeast of Methodist Chapel; copper nail in root of white-oak tree.	731.01
Deerlick, northeast corner of Baptist Church lot, 450 feet east of post office and T road north; iron post stamped "683, Ky."	683.401
Deerlick, 0.7 mile east of, in center of road, 0.3 mile east of Ashler schoolhouse; copper nail in root of 24-inch black-oak tree	666.38
Deerlick, 1.4 miles east of, on north side of road, at large poplar tree, 240 feet southeast of James Wisecarver's residence; chiseled square on large sandstone rock. . .	610.60
Twin Tunnel station, in front of, top of rail	500.8
Belton, 180 feet southeast of post office, in southwest corner of hotel yard; iron post stamped "427, Ky."	426.992
Belton, 1.3 miles north of, south end of drain tile, 14 feet east of railroad, opposite residence of John Clearance.	485.90
Browder, 0.3 mile south of, on north abutment of bridge at east side; chiseled square on coping stone	420.29
Browder, 0.8 mile north of, 17 feet west of south end of yard limit sign; copper nail in small culvert under railroad	404.32

BUTLER, DAVIESS, HANCOCK, HOPKINS, MCLEAN, MUHLENBERG, OHIO, AND WEBSTER COUNTIES.

The leveling was done in 1907 mostly by H. W. Peabody. One line in Earlington quadrangle was run by G. W. Crane.

From Providence east along highways to Madisonville.

	Feet
Nebo, in west face of northwest corner of D. C. Moorow's brick store, at southwest corner of crossroads; aluminum tablet stamped "411, 1907".....	410.153
Manitou, 700 feet east of center of town, at southeast corner of cross roads, in west face of northwest corner pier of church; aluminum tablet stamped "428, 1907".....	427.488

From Earlington west along highways to point 2.7 miles southwest of Dalton.

Earlington, in west face of northwest corner of Peoples Bank Building, in stone under ventilator flue; aluminum tablet stamped "423, 1907".....	422.704
Beulah, 150 feet west of T road north, at northwest corner of Franklin's store; iron post stamped "Prim. Trav. Sta. No. 5, 540, 1907".....	540.175
Beulah, 2.8 miles west of, north side of road, 0.25 mile east of crossroads, at east end of John McGregor's house, in south face of brick chimney; aluminum tablet stamped "512, 1907"	512.106

From Calhoun south along highways to Sacramento.

Semiway post office, 4.5 miles south of Calhoun, in south face of southwest corner pier of post office and store building; aluminum tablet stamped "400, 1907".....	401.070
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From point 1.2 miles north of Earles east along Kentucky Midland R. R. to Rockport.

Bethel Church, 5 miles west of Central City, northeast corner of crossroads, in south face of southwest corner of brick church building; aluminum tablet stamped "Prim. Trav. Sta. No. 7, 502, 1907".....	501.280
Central City, in west face of northwest corner of Gish Bank building; aluminum tablet stamped "427, 1907".....	426.509
Nelson, 1 mile west of, 360 feet west of milepost "Louisville, 122," Illinois central R. R. concrete bridge No. T 122 06, in bridge seat at southeast corner; aluminum tablet stamped "405, 1907".....	404.316

From Livermore south along Louisville & Nashville R. R. to Central City.

	Feet
Livermore, in wall of Bank of Livermore building (brick), at southwest corner, 1.9 feet from ground; aluminum tablet stamped "401, Louisville".....	401.047
Island, in west end of stone box culvert about 1,200 feet south of station; aluminum tablet stamped "418, 1907".....	416.956
Moorman, 0.5 mile north of, 40 feet east of wagon road, in next to top coping stone at northwest corner of small stone culvert; aluminum tablet stamped "410, 1907".....	409.286
South Carrollton, on west side of M. E. Church, in foundation pier next to southwest corner; aluminum tablet stamped "457, 1907".....	456.581

From Central City south along Louisville & Nashville R. R. to Cleaton, thence east along highways to Paradise.

Cleaton, 90 feet east of station, in bottom stone at southeast corner of culvert; aluminum tablet stamped "444, 1907".....	443.083
Mount Carmel Church, 3 miles west of Paradise, in south face of southeast corner foundation pier of church; aluminum tablet stamped "504, 1907".....	503.295

From Heflin south along highways to Centertown.

James Hill on Knott's Ferry road, 4 miles northwest of Centertown, 3.5 miles south of Heflin, west side of road on top of hill, in top of sandstone bluff; aluminum tablet stamped "507, 1907".....	506.411
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From Centertown south along highways to Rockport, thence east along Kentucky Midland R. R. to Rosine.

Centertown, in south face of southeast corner of Dr. Chapman's brick block; aluminum tablet stamped "447, 1907" ..	446.686
West Providence Church, 3 miles north of Rockport, at northeast corner of church; iron post stamped "Prim. Trav. Sta. No. 12, 477, 1907".....	476.393
Rockport, in west face of northwest corner of Rockport Deposit Bank building; aluminum tablet stamped "437, 1907"	436.326
Rockport, in front of station; top of north rail.....	407.0
Simmons, 1 mile west of, in top of parapet wall at southwest corner of bridge over Lewis Creek; aluminum tablet stamped "405, 1907".....	404.309
Simmons, at station, top of rail.....	406.0

McHenry, in west face of southwest corner of Odd Fellows and Red Men Hall; aluminum tablet stamped "428, 1907"....	Feet 426.988
Render station, road crossing; top of rail.....	445.5
Beaver Dam, in west face of southwest corner of People's Bank building; aluminum tablet stamped "414, 1907".....	413.353
Beaver Dam, 3 miles east of, 1,260 feet east of road crossing, in bridge seat at southwest corner of bridge over Slough Creek; aluminum tablet stamped "410, 1907".....	409.038
Horton, 100 feet west of station, in top of northeast corner of stone pier of water tank; aluminum tablet stamped "428, 1907".....	427.169

From Logansport west along highways to Paradise.

New Point Pleasant Church, in north face of northwest corner of foundation pier of church; aluminum tablet stamped "461, 1907" ..	460.177
Cool Springs Church, in west face of northwest corner foundation pier; aluminum tablet stamped "577, 1907".	576.308
Wysox, at northeast corner of crossroads, in west face of southwest corner foundation pier of Pleasant Valley Church; aluminum tablet stamped "402, 1907".....	400.815
Paradise, in northeast corner of hotel yard; iron post stamped "Prim. Trav. Sta. No. 11, 409, 1907" ..	408.031

From Logansport north to Mount Pleasant Church.

Cromwell, 75 feet west of school building, in stone block in front of T. C. Pirtle's store; aluminum tablet stamped "485, 1907" ..	482.704
Bald Knob Church, at southeast corner of; iron post stamped "Prim. Trav. Sta. No. 15, 550, 1907".	549.547

From Mount Pleasant Church north along highways to Mount Vernon Church.

Mount Pleasant Church, 3 miles south of Rosine, in west face of northwest corner of foundation pier; aluminum tablet stamped "578, 1907".	577.114
Rosine, northwest corner of road forks, in foundation, center of south side of J. T. Allen's store; aluminum tablet stamped "565, 1907".....	563.939

At Logansport.

Logansport post office, at northwest corner of Lebanon Church; iron post stamped "Prim. Trav. Sta. No. 16, 472, 1907" ..	470.783
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From Slaughterterville south along Louisville & Nashville R. R. to Earlington.

Slaughterterville, at main south entrance to town-hall building, in limestone doorsill, on west side; aluminum tablet stamped "403, Adj., 1903".....	Feet 402.887
Hanson, north side of road, 150 feet east of railroad, in south face of southwest corner of hotel building; aluminum tablet stamped "433, 1907".....	432.503
Hanson, 2.5 miles south of, in west face of northwest corner of foundation of Mount Zion Church; aluminum tablet stamped "493, 1907".....	493.052
Madisonville, in northwest corner of courthouse yard; iron post stamped "Prim. Trav. Sta. No. 2, 470, 1907".	470.249

From Earlington south along Louisville & Nashville R. R. to Mortons Gap, thence northeast along highways to Salem Church.

Barnsley, 100 feet west of Louisville & Nashville R. R., in front of St. Bernard Mining Co.'s store; iron post stamped "Prim. Trav. Sta. No. 3, 484".....	483.607
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From Salem Church northeast along highway to Earles, thence north to Sacramento, thence west to Hanson.

Free Henry Ford, 1 mile west of, 6 miles northeast of Mortons Gap, in north face of northeast corner of foundation of Henry Whitefield dwelling; aluminum tablet stamped "417, 1907" ..	417.038
Pleasant Hill Church, 4 miles west of Earles post office, in east face of southeast corner foundation pier of church; aluminum tablet stamped "608, 1907".....	608.407
Earles post office, at southeast corner of crossroads, in foundation pier under center of west side of house of Mr. Sumners; aluminum tablet stamped "512, 1907".....	512.216
Briar Creek Church, 3 miles north of Earles, in east face of southeast corner foundation pier of church; aluminum tablet stamped "476, 1907".....	476.213
Sacramento, 3 miles south of, at southeast corner of road forks, in west face of southwest corner of J. M. Harned's brick house; aluminum tablet stamped "429, 1907".....	429.936
Sacramento, 400 feet west of main street, at east corner of village school building; iron post stamped "Prim. Trav. Sta. No. 8, 497".....	497.630
Sacramento, 4 miles west of, Tower Chapel, in north face of northwest corner of foundation pier; aluminum tablet stamped "422, 1907".....	422.796

Hanson, 6 miles east of, 2 miles west of Pond River, in south face of southwest corner foundation pier of C. E. Eastwood's dwelling; aluminum tablet stamped "391, 1907".....	391.523
Providence Church, 2 miles east of Hanson, in west face of southwest corner foundation pier; aluminum tablet stamped "459, 1907".....	459.248

From Owensboro east along Illinois Central R. R. to Reynolds Station, thence north along highways to Pellville.

Philpot, under southeast corner of J. P. Simpson's drug store, in east side of brick pillar; aluminum tablet stamped "400, Louisville"	399.036
O'Donnell, in front of station; top of rail.....	406.8
Shorts station (Whalen), in east face of brick chimney at east end of house, 720 feet west of road crossing, 120 feet north of track; aluminum tablet stamped "433, 1907"	432.143
Whitesville, 0.2 mile east of center of town, in south face of southwest corner of Baptist Church; aluminum tablet stamped "507, 1907".....	506.312
Colliers, in front of station; top of rail.....	454.7
Deaneffield station (Aetnaville), 0.2 mile east of railroad station, at southwest corner of road crossing, at southeast corner of store, in south face of foundation pier; aluminum tablet stamped "445, 1907".....	444.389
Reynolds, 100 feet north of Illinois Central R. R., west side of road, at north end of W. S. Richard's house, in east face of brick chimney; aluminum tablet stamped "498, 1907".....	497.145
Haynesville, at southeast corner of crossroads, in west face of southwest pier of church; aluminum tablet stamped "477, 1907"	476.371
Lyonia, at northwest corner of road forks, under east side of store, in foundation pier; aluminum tablet stamped "516, 1907"	514.693
Lyonia, 2 miles west by northwest of, 3 miles southeast of Pellville, in north face of northwest corner pier of Baptist Church; aluminum tablet stamped "628, 1907".....	627.066

From Philpot south along highways to Hewlett's store, thence west to Utica.

Cane Run schoolhouse, 5.5 miles south of Philpot, at southwest corner of T road west, in north face of northeast corner foundation pier of schoolhouse; aluminum tablet stamped "427, 1907"	425.196
Pleasant Ridge, 1.5 miles north of, at northeast corner of road forks, in south face of brick chimney at east end of Hewlett's store; aluminum tablet stamped "429, 1907".....	427.965

From Deaneffield south along highways to Magan, thence west to Hewlett's store.

Magan, 400 feet north of road forks, on west side of road, in south face of southwest corner foundation pier of church; aluminum tablet stamped "619, 1907".....	617.098
Ralph, 80 feet west of road forks, in southeast corner of iron bridge over Panther Creek, in bridge seat; aluminum tablet stamped "431, 1907".....	429.664
New Panther Creek Church, 4 miles south of Whitesville, in west face of northwest corner pier; aluminum tablet stamped "418, 1907".....	416.664
Bell Run (Westfield), 200 feet south of crossroads, on west side of road, northwest corner foundation pier of church, in north face; aluminum tablet stamped "465, 1907".....	463.526
Bell Run (Westfield), 3 miles west of, 3 miles east of Hewlett's store, in stone post at south side of road forks; aluminum tablet stamped "Prim. Trav. Sta. No. 2, 469, 1907"	467.291

From Heflin east along highways to Crabtree's ferry, thence along highways to Magan.

Beda, 400 feet east of road forks, in south face of southwest corner foundation pier of Beulah Church; aluminum tablet stamped "547, 1907".....	546.514
Washington Church, 3 miles east of Beda, in north face of northeast corner foundation pier; aluminum tablet stamped "457, 1907"	456.478
Marvins Chapel, 1 mile south of Sunnydale, at northwest corner of church, in west face of foundation pier; aluminum tablet stamped "420, 1907".....	418.738
Sulphur Springs, in north face of northwest corner of C. B. Bean's store; aluminum tablet stamped "419, 1907".....	417.837
Dundee, in west face of northwest corner of Dundee Deposit Bank building; aluminum tablet stamped "426, 1907"	424.213

From Sulphur Springs south to Mount Vernon Church.

Mount Vernon Church, 1.5 miles south of Sulphur Springs, northwest corner of crossroads, southeast corner of church; iron post stamped "Prim. Trav. Sta. No. 14, 600".....	599.430
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CALDWELL, CRITTENDEN, DAVIESS, HANCOCK, HENDERSON,
HOPKINS, McLEAN, OHIO, UNION, AND WEBSTER
COUNTIES.

The elevations in the following list are based upon adjusted lines of precise leveling of the United States Geological Survey and the U. S. Corps of Engineers.

The leveling was done in Owensboro and Tell City quadrangles in 1900 by Dean Halford; in Henderson, Newburg, Calhoun, and Sebree quadrangles, in 1902, by H. S. Lowe; in Calhoun and Sutherland quadrangles, in 1903, by F. M. Goodhue; in Sebree quadrangle, in 1907, by H. W. Peabody; in Morganfield, Newburg, Sebree, and Sutherland quadrangles, in 1904, by L. L. Lee; in 1906, in Morganfield and Providence quadrangles, by R. P. Thompson; and in Providence quadrangle by Thompson and G. W. Crane.

From Hawesville west along Louisville, Henderson & St. Louis Ry. to Maceo, thence to Rockport, Ind.	
Hawesville, in stone foundation at southeast corner of courthouse; aluminum tablet stamped "422, Vin" (redetermined by Ohio River Survey, U. S. Corps of Engineers).....	Feet 419.855
Lewisport, in southeast corner of Dentin's store, 39 feet east of doorstep; bronze tablet stamped "393, Vin"	394.450
From Owensboro east to Knottsville, thence northeast to Hawesville.	
Knottsville, 300 feet southeast of post office, opposite hotel; iron post stamped "559, Vin". ..	560.413
From Knottsville southeast to Pellville. (Single-spur line.)	
Pellville, 1,000 feet east of crossroads, 10 feet south of Hardinsburg road, in northeast corner of lot in which J. H. Abeuchain's house is situated; iron post stamped "531, Vin"	533.199
From Maceo southwest along Louisville, Henderson & St. Louis Ry. to Stanley.	
Maceo, 2.5 miles southwest of, 210 feet south of railroad bridge over Pup Creek, 20 feet west of railroad crossing, in Nat Young's field; iron post stamped "391, Vin"	391.691

Owensboro, in southeast corner of courthouse square, meridian mark on stone post; aluminum tablet stamped "394, Vin"	Feet 395.400
Owensboro, in northeast corner of courthouse yard, meridian mark on stone post; aluminum tablet stamped, "396, Louisville" (redetermined by Ohio River Survey, U. S. Corps of Engineers)	394.638
Stanley, 50 feet south of railroad crossing, in southeast corner of forks of roads; iron post stamped "385, Vin"..	386.430
From Stanley along highway south to Sorgho, thence east to Owensboro.	
Sorgho, west end of, in southeast corner of forks of road; iron post stamped "389, Vin".....	390.292
From Stanley west along Louisville, Henderson & St. Louis Ry. to Lee's switch.	
Worthington, 300 feet west of station, south of track, in northwest corner of sandstone foundation of water tank; aluminum tablet stamped, "385, Adj., 1903".....	383.872
Reed, 60 feet south of station, in northeast corner of Charles Williams' store; aluminum tablet stamped "379, Adj., 1903"	378.215
Spottsville, 600 feet east of, west edge of railroad bridge over Green River, in northwest corner of west sandstone pillar; aluminum tablet stamped "385, Adj., 1903".....	384.442
Baskett, 200 feet east of station, north of track, in foundation at southeast corner of tank room of Pittsburg Coal Co.; aluminum tablet stamped "401, Adj., 1903" (reported destroyed October, 1907)	400.316
From Lee's switch along highway southeast to Hebbardsville, thence east to Sorgho.	
Zion, in west side of northwest pillar of Zion Baptist Church; aluminum tablet stamped "455, Adj., 1903" ..	454.761
Hebbardsville, northwest corner of crossroads at, in southeast brick pillar of C. W. Johnson's store, on east side; aluminum tablet stamped "426, Adj., 1903".....	424.964
Hamilton's ferry over Green River, 1,500 feet east of, in north side of brick chimney of house owned by Ed. Hamilton and occupied by James Estler; aluminum tablet stamped "404, Adj., 1903"	403.300
From Lee's switch west along Louisville, Henderson & St. Louis Ry. to Henderson, thence north to Evansville.	
Lee's switch, 4 miles east of, in southeast brick pillar of Race Creek Church; aluminum tablet stamped "405, Adj., 1903"	404.551
Henderson, in south corner of front window sill of Planters State Bank building; aluminum tablet stamped "399, Vin"..	400.737

From Calhoun along highway southeast to Livermore.

Buel, opposite McEwen's general store, in base of outside chimney at east end of Mrs. Susan A. Davis's house; aluminum tablet stamped "446, Louisville".....	Feet 445.633
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From Livermore north along Louisville & Nashville R. R. and highway to Owensboro.

Utica, in south face of Utica Deposit Bank building (brick), immediately west of large front window; aluminum tablet stamped "418, Louisville"	416.984
Browns Valley (Crow-Hickman station), crossing just south of; highest rail	407.7
Sutherland, highway crossing; top of rail.	398.0
Petit, 0.9 mile south of, nearly opposite "Smith" road, in north base of chimney at north end of house owned by Albert Sisson; aluminum tablet stamped "390, Louisville" ..	389.585

From Sorgho southeast along highway to Moseleyville, thence east to Sutherland.

Lyddone bridge, 1 mile southeast of St. Raphael Church, in sandstone foundation of bridge over Panther Creek; aluminum tablet stamped "384, Adj., 1903"	383.471
Moseleyville, 0.9 mile east of, in base of chimney at north end of house on west side; aluminum tablet stamped "396, Louisville"	395.326

From Livermore along highway northeast to Heflin, thence north to Maxwell, thence west to Livia.

Heflin, 0.9 mile west of, 600 feet east of Woodward's Valley Church, in northeast corner of rock foundation to iron bridge over Barnett Creek; aluminum tablet stamped "388, Adj., 1903"	387.617
Livia, 1 mile east of, west side of base of chimney at west end of Mrs. R. Tanner's house, 1.3 feet from ground; aluminum tablet stamped "476, Louisville" ..	475.457

From Sorgho along highway south to Cleopatra, thence southeast to Calhoun.

Sorgho, 3 miles southwest of, on West Louisville-Sorgho road, at south end of west side of bridge over Panther Creek; cross cut on top of abutment stone	380.12
West Louisville, in front of J. H. Elder's store, 1.5 feet above platform, at left of main entrance; aluminum tablet stamped "462, Louisville"	461.711

Cleopatra, in base of chimney, at south end of C. L. Short's house, 1.9 feet above ground; aluminum tablet stamped "498, Louisville"	Feet 497.439
Calhoun, in top of limestone belt course (water table) around courthouse 1.6 feet south of main entrance; aluminum tablet stamped "397, Louisville"	396.908

From Calhoun northwest along highway to Beech Grove, thence west to Sebree.

Beech Grove, in west wall of McLean County Bank building, 3.9 feet from northwest corner, 2 feet from ground; aluminum tablet stamped "408, Louisville" ..	407.407
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From Delaware northwest along highway to Euterpe. (Single-spur line from circuit from Beech Grove to West Louisville.)

Euterpe, in north side of base of chimney at north end of Walter Scott's house, 0.25 mile east of Cash Creek Baptist Church; bronze tablet stamped "468, Louisville"	467.353
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From Elmwood east along highway via Onton and Ashbyburg to Calhoun.

Elmwood, in front of Louisville & Nashville R. R. station; top of rail	391.2
Onton, in base of outside chimney of post office, which is Bryant's house; aluminum tablet stamped "478, Louisville" ..	479.414
Ashbyburg, in east wall of Brown & Luck's store, 2.3 feet from southeast corner and 2.3 feet from ground; aluminum tablet stamped "391, Louisville"	391.314
Calhoun (Rumsey), river gauge at Government locks on Green River, elevation of "17" upper gauge and "29" lower river gauge	372.94

From Sebree north via Louisville & Nashville R. R. to Henderson.

Sebree, in east face of brick schoolhouse, north side of main entrance; aluminum tablet stamped "499, Louisville" ..	499.838
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From Robards northwest along highway to Corydon, thence southwest to Oakland schoolhouse.

Rock Springs, 7.4 miles east of, at Cherry Hill Church, on Frog Island road, at T road west, in sandstone pillar in southwest corner of west face of church; aluminum tablet stamped "424, Adj., 1903"	423.794
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Rock Springs, in northwest angle of crossroads, in front of Green Whittege's house; iron post stamped "486, Adj., 1903"	Feet 485.673
Corydon, on west side of Main street, in limestone doorsill of public schoolhouse, on south edge of main entrance; aluminum tablet stamped "459, Adj., 1903"	458.619
Corydon, 4.8 miles southwest of, on road to Herman running east and west to connect with the Sulphur Springs road running north and south, 3 feet from northeast corner of Oakland schoolhouse; iron post stamped "423, Adj., 1903"	422.767
From Sebree along highway northwest to Poole, thence southwest to Tilden.	
Pratt, in northwest corner of crossroads, in southwest pillar of blacksmith shop; aluminum tablet stamped "502, Adj., 1903"	502.144
Poole, near crossroads, 1 foot west of northeast corner of Poole Deposit Bank building; aluminum tablet stamped "499, Adj., 1903"	498.674
Wanamaker, J. A. Aldridge's store, in northwest corner of crossroads, in southeast sandstone pillar, 0.5 foot above ground; aluminum tablet stamped "445, Adj., 1903"	444.544
Tilden, at southeast corner of crossroads, in northwest pillar of Tapp & Townsend's store; aluminum tablet stamped "425"	425.114
From Tilden along highway south to Dixon, thence east to Slaughterville.	
Tilden, 2.8 miles south of, at junction with north-south road from Wanamaker to Dixon, in northwest corner of forks, in front of Tom Watson's house; iron post stamped "605, Adj., 1903"	604.594
Dixon, Webster County courthouse, on west side, 5 feet north of main entrance, 4 feet above ground; aluminum tablet stamped "543, Adj., 1903"	543.508
Catesville, 0.6 mile northwest of, on Slaughterville road, in southeast corner of rock foundation of iron bridge over Deer Creek; aluminum tablet stamped "397, Adj., 1903"	397.986
Catesville, 3.2 miles east of, on road to Slaughterville, in sandstone pillar at northwest corner of Mount Pleasant Church; aluminum tablet stamped "569, Adj., 1903"	569.658
From Sebree south along Louisville & Nashville R. R. to Slaughterville.	
Sebree, 4 miles south of, at south end of Breton switch on Louisville & Nashville R. R., at road crossing, in northwest corner and 2 feet west of right-of-way corner post; iron post stamped "384, Adj., 1903"	384.463

From Oakland schoolhouse along highway southwest to Herman, thence southeast to Tilden.	
Herman, in front of J. M. Cottingham's store, in northwest angle of T road; iron post stamped "402, Adj., 1903"	Feet 401.439
Topeka, at northwest angle of crossroads, in south face of southeast sandstone pillar of large white church; aluminum tablet stamped "430, Adj., 1903"	430.341
From Herman along highways to Waverly, thence along Illinois Central R. R. to Grove Center.	
Herman, 3.45 miles northwest of, 25 feet north of three-road intersection, 2 feet south of fence, 300 feet northwest of A. G. McClanahan's house, 25 feet east of telephone pole; iron post stamped "415, Adj., 1903"	414.894
Waverly, in garden in north corner of H. T. Willett's front yard, in sandstone post 3 feet from fence; bronze tablet stamped "Prim. Trav. Sta. No. 8, 408"	407.592
Flournoy station, 70 feet from southeast corner of Illinois Central R. R. station, 65 feet west of locust tree, 24 feet northwest of center of highway; iron post stamped "419, Adj., 1903"	418.760
Morganfield, 200 feet southwest of Illinois Central R. R. station, on northeast corner of abutment of concrete bridge over small creek; chiseled square	408.841
Harding station, 50 feet east of southeast corner of, 18 feet south of warning post, 3 feet north of fence; iron post stamped "379, Adj., 1903." (Recovered by precise leveling.)	378.925
From Sturgis southeast to Sullivan.	
Sturgis, at right of entrance of First National Bank building, at first stone, in top stone of foundation wall; aluminum tablet stamped "379, Adj., 1903"	378.608
From Sullivan along highways via Hearin and Shelton to Topeka crossroads.	
Wynn's bridge, 500 feet northeast of, 30 feet from northwest corner of Woodmont's mill, at center of three-road corners; iron post stamped "364, Adj., 1903"	364.223
Hearin post office, in east corner of Mrs. Jennie Nall's garden, east corner of blacksmith shop bears north 50° 30' W., distant 141 feet; north corner of Mrs. Nall's residence bears S. 25° 15' W., distant 63 feet; in sandstone post 8 by 15 by 36 inches set 30 inches in ground; bronze tablet stamped "Prim. Trav. Sta. No. 9, 468, Adj., 1903"	467.882

Shelton, 1.1 miles southwest of, at T roads, Morganfield and Dixon pike, 10 feet from northeast corner of small bridge, 16 feet north of bank of ditch; iron post stamped "407, Adj., 1903"	Feet
407.216	
Shelton, 2.69 miles, northeast of, at T roads at J. E. Gibson's; iron post stamped "566, Adj., 1903"	565.667
Topeka, at northwest angle of crossroads, in south face of east sandstone pillar of large white church; aluminum tablet stamped "430, Adj., 1903"	430.341

**From Morganfield via Illinois Central R. R. to Uniontown.
(Checked spur line.)**

Morganfield, 3.36 miles north of, in center of three-road corners, 200 feet southwest of road crossing, about 1 mile north of Chapman station on Uniontown Branch of Illinois Central R. R.; iron post stamped "376, Adj., 1903"	376.108
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From Morganfield along highway via Cullen and Bordley to Hearin.

Morganfield, in center face of west column at entrance to county courthouse; aluminum tablet stamped "439, Adj., 1903"	439.127
Morganfield, 3.56 miles southeast of, at northeast corner of Baptist Church at Little Union, in stone post; aluminum tablet stamped "448, Adj., 1903"	447.912
Little Union, 5.5 miles south of, north of road, 20 feet from southeast corner of I. H. Mahan's house, 2 feet outside of fence; at northwest angle of three-road corners at Cullen; iron post stamped "476, Adj., 1903"	475.783
Bordley, north part of town, northeast corner of brick foundation of Baptist Church; aluminum tablet stamped "417, Adj., 1903"	416.290

At Uniontown. (By checked spur line from Morganfield.)

Uniontown, in south part of, in south part of R. H. Looper Tobacco Co.'s property, nail in black-oak tree, bears N. 23° 30' W., distant 10.2 feet; south corner of tobacco factory (main building), bears N. 25° 15' E., distant 103.9 feet; corner post to south corner of fence is 4.6 feet distant, in top of sandstone post 7 by 13 by 26 inches, set 23 inches in ground; aluminum tablet stamped "Prim. Trav. Sta. No. 13, 360, Adj., 1903"	359.779
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From Sullivan along Illinois Central R. R. via Blackford to Clay.

Sullivan, in north corner of John McGraw's front yard, north east corner of McGraw's house bears S. 33° 45' E., distant 166 feet; bronze tablet stamped "Prim. Trav. Sta. No. 10, 395, Adj., 1903"	Feet
395.286	
Blackford, in top stone, center of northwest abutment of Illinois Central R. R. drawbridge over Trade Water River; aluminum tablet stamped "362, Adj., 1903"	361.876
(Either or both of the following two elevations may be 1 foot too great.)	
Wheatcroft, 83 feet west of store opposite station, at southeast angle of T roads, 88 feet east of railroad bridge at station; iron post stamped "376, Adj., 1903"	375.947
Clay, at railroad crossing, at southeast corner in east face of red brick block owned by the Clay Mercantile Co.; aluminum tablet stamped "380, Adj., 1903"	379.941

From Clay along Louisville & Nashville R. R. to Providence.

(The first elevation of this list may be 1 foot too great.)	
Clay, 3.18 miles southeast of, in center of top of west abutment of concrete retaining wall; iron pipe stamped "374, Adj., 1903"	373.485
(One foot adjustment made between these bench marks.)	
Providence, in face of fence wall of T. B. Payne's residence at northeast corner of T. B. Payne's store; aluminum tablet stamped "453, Adj., 1903"	451.717

From Providence along highway through Dalton, Creswell, Starr, and Tribune to highway crossing north of Repton.

Providence, 3.86 miles southeast of, in top stone of middle abutment east side of iron highway bridge over Clear Creek; aluminum tablet stamped "355, Adj., 1903"	353.824
Providence, 8.53 miles southeast of, 3 feet north of center of front of schoolhouse at Dalton; iron post stamped "Prim. Trav. Sta. No. 18, 438, Adj., 1903"	436.507
Dalton, 2.74 miles southwest of, in top stone of northeast abutment, center of iron highway bridge over Tradewater River; aluminum tablet stamped "372, Adj., 1903"	371.114
Dalton, 6.01 miles southwest of, in top of stone on northeast abutment of iron highway bridge over Dollson Creek; aluminum tablet stamped "372, Adj., 1903"	371.062
Quinn, 2.23 miles west of, 18 feet from schoolhouse, at southwest corner, 23.9 feet northeast of black walnut tree at Walnut schoolhouse; iron post stamped "Prim. Trav. Sta. No. 17, 1906, 588, Adj., 1903"	586.792

Creswell, 1.68 miles southwest of, 100 feet east of three-road corners, 8 feet south of center of road, 400 feet west of Pleasant Hill Log Church, near road to north, in top of ledge of rocks; aluminum tablet stamped "417, Adj., 1903"	416.916
Pleasant Hill, 3.48 miles west of, 500 feet southeast of D. W. Vinson's house, at northeast corner of T roads, 20 inches from corner of fence; iron post stamped "Prim. Trav. Sta. No. 16, 464, Adj., 1903"	463.939
Starr, at northeast angle of crossroads, in southwest corner of foundation wall of red brick church; aluminum tablet stamped "541, Adj., 1903"	541.082
Tribune, 31 feet west of southeast corner of cross roads, 4 feet north of fence, 12 feet south of tree, in ledge of rocks; aluminum tablet stamped "431, Adj., 1903"	430.695
Tribune, 1.86 miles north of, inside southwest fence corner at crossroads; iron post stamped "Prim. Trav. Sta. No. 15, 1906, Adj., 508"	507.954

From Repton along Illinois Central R. R. to Blackford.

Hoods station, 300 feet northwest of north end of switch, 30.5 feet west of west rail at post "J. E. 66-52," at highway crossing, in ledge of rocks; aluminum tablet stamped "444, Adj., 1903" (Recovered by precise levels)	444.268
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From Blackford via Fish Trap and Shady Grove to Walnut Grove. (Unadjusted secondary levels.)

Blackford, in top stone, center of northwest abutment of Illinois Central Railroad drawbridge over Tradewater River; aluminum tablet stamped "362, Adj., 1903"	361.876
Fish Trap, in foundation of Enon Church, in second stone from southwest corner; aluminum (probably) tablet stamped "409"	408.973
Shady Grove, in foundation of S. T. Towery's house; aluminum tablet (probably) stamped "426"	426.423
(The above line has not been adjusted on account of excessive closure error.)	

From Grove Center along highway to Sturgis.

Gum Grove, northeast corner of Ben F. Perkins' front yard, northeast of residence, bears S. 56° 45' W., distant 39.9 feet; front face of silver poplar tree bears N. 51° W., distant 34.4 feet; telephone pole bears N. 32° E., 6 feet distant; in top of sandstone post 7 by 12 by 24 inches; aluminum tablet stamped "386, Adj., 1903, Prim. Trav. Sta. No. 11"	386.065
Grove Center, 4.72 miles south of, 6 feet north of large oak tree, 2 feet east of wire fence at T roads; iron post stamped "369, Adj., 1903"	369.220

CALDWELL, CHRISTIAN, HOPKINS, AND LYON COUNTIES.

The elevations in the following list were determined by primary leveling extended from the precise-level line from Shawneetown, Ill., to Cerulean, Ky., and the precise-level line of the United States Corps of Engineers along the Ohio River as adjusted by the Coast and Geodetic Survey.

The leveling was done in Cobb and Kuttawa quadrangles, in 1908, by E. C. Bibbee; in Dawson Springs quadrangle, in 1907, by H. W. Peabody, in 1908 by Bibbee, and in 1909 by S. R. Archer; in Princeton quadrangle, in 1908, by Bibbee, and, in 1909, by Archer; and in Nortonville quadrangle, in 1907, by Peabody, in 1909, by Archer, and, in 1910, by Ed. Shea and C. B. Shaw. The line from Fruit Hill to Kirkmansville was rerun in 1911 by Bibbee, and a new adjustment was made of the lines from Fruit Hill to Johnson and from Fruit Hill to Crofton.

From Cobb via Hopson to point 3 miles northwest of Lamasco.

Cobb, at southwest corner of store occupied by S. C. Sizemore, opposite station, north side of track at railroad crossing; iron post stamped "462"	462.687
Hopson, in foundation of office building owned by L. A. Hopson, 150 feet south of crossroads, 20 feet west of center of public road; aluminum tablet stamped "544"	544.629
Hopson, 2.77 miles northwest of, in paint spot on line rock in center of road; chiseled square painted "525.9"	526.14
Hopson, 5.28 miles northwest of, in northwest side of chimney foundation of Joe Prescott's residence; aluminum tablet stamped "Prim. Trav. Sta. No. 19, 535"	535.552

From Claxton to Dawson Springs, thence north about 4 miles.

Claxton, 3.0 miles east of, in west abutment south side of iron bridge; aluminum tablet stamped "411"	410.797
Dawson Springs, 1.0 mile west of, 100 feet east of railroad crossing, on west concrete abutment north side of iron railroad bridge; chiseled square painted "400.53"	400.79
Dawson Springs, 120 feet north of railroad, in southwest corner of Christian Church; aluminum tablet stamped "436"	435.797
Dawson Springs, in foundation of Dawson Salt & Water Co.'s store, at east entrance; aluminum tablet stamped "Prim. Trav. Sta. No. 22, 414"	414.326

Dawson Springs, 1.3 miles north of, on south end of culvert leading to Rosedale Cemetery at Y road; chiseled square painted "437.0"	Feet 437.34
Dawson Springs, 2.4 miles north of, on sandstone ledge east of road; chiseled square	480.05
Dawson Springs, 3.5 miles northwest of, on large rock north of road, 25 feet west of T road; chiseled square	407.83
From Dawson Springs east along Illinois Central R. R. via St. Charles to Daniel Boone.	
Dawson Springs, 3.4 miles northeast of, 1.4 miles west of Ilsley station, opposite milepost "N. O. 627, L. 162," on south right-of-way line; iron post stamped "397"	396.937
Ilsley station, southeast corner of platform on south side of track, in floor; copper nail marked "410.69"	410.94
Hamby, 110 feet east of station, on south right-of-way line, east side of road, 60 feet east of railroad; iron post stamped "412"	412.541
St. Charles, 100 feet northeast of station, 40 feet north of fence corner, bend in public road to east, east side of road, at foot of telephone pole; iron post stamped "427"	427.031
Daniel Boone, 40 feet south of platform, 80 feet northeast of coal company's store; iron post stamped "494"	494.545
From Crofton along roads west to point 2.5 miles north of Era, thence south to Era, thence west to Hawkins post-office, thence northwest to point 1.5 miles south-east of Friendship.	
Crofton, 1.4 miles west of, at private roads, south side of main road, east side of gate, in root of 1½-foot sweet-gum tree; copper nail marked "638.8"	638.95
Crofton, 2.6 miles west of, T road north, northwest corner of roads, inside fence corner; iron post stamped "637"	636.881
Crofton, 2.8 miles west of, T road southwest, north side of road at forks, on top of stone; chiseled square marked "620.5"	620.65
Crofton, 4 miles west of, in front of Geo. Bowlan's residence, in top of west side of small plank bridge; copper nail marked "512.6"	512.69
Crofton, 5.7 miles west of, T road southwest, on top of stone bowlder, at northeast corner; chiseled square marked "578.1"	578.19
Crofton, 6.2 miles west of, 2.5 miles north of Era, 2.8 miles southeast of Pod, at southeast corner of crossroads; iron post stamped "605"	604.749
Era, 1.9 miles north of, T road west, in center of road, in root of 2-foot hickory tree; copper nail marked "642.9"	643.01

Era, 0.8 mile north of, private road west to house, in top of stump on east side of road; copper nail marked "655.03"	Feet 655.15
Era, T road west, 300 feet south of store, at blacksmith's shop, northwest corner of road forks; iron post stamped "683"	682.758
Era, 2 miles northwest of, 500 feet west of main branch of Camp Creek, 50 feet east of bend in road to southwest, on top of rock outcrop on north side of road; chiseled square marked "500.9"	501.04
Era, 2.7 miles west of, T road northwest, south side of road forks, in base of 6-inch hickory tree; copper nail marked "561.1"	561.17
Era, 3 miles west of, at Mount Carmel schoolhouse, north side of road, 110 feet south of southwest corner of schoolhouse, 30 feet north of center of road; iron post stamped "572"	572.527
Era, 3.8 miles west of, about 900 feet north of Mount Carmel Church, east side of north-south road, at crossroads, in root of 2-foot oak tree; copper nail marked "742.4"	742.49
Hawkins postoffice, 0.7 mile south of, at northeast corner of road forks, 1 foot from east end of plank culvert, on top of rock bottom of drain; chiseled square marked "736.4"	736.48
Hawkins, opposite store, east side of road at foot of fence corner; iron post stamped "759"	759.716
Hawkins, 0.6 mile northwest of, T road west, on west side of main road, on top of stone; chiseled square marked "755.05"	755.15
Hawkins, 0.6 mile northwest by 1.9 miles southwest of, 150 feet southwest of private road to north through woods, in center of road on top of stone; chiseled square marked "545.6"	545.72
Hawkins, 0.6 mile north by 3.3 miles southwest of, about 2 miles northwest of Bainbridge postoffice, on Princeton pike, at southeast corner of crossroads, 100 feet south of center of crossroads, at fence line; iron post stamped "555"	555.624
Friendship, 3.3 miles southeast of, southwest corner of crossroads, 500 feet south of small store, 8 feet from small sycamore tree; iron post stamped "506"	506.629
From St. Charles south along roads via Pod postoffice to point 2.5 miles north of Era.	
St. Charles station, 0.5 miles west by 1.5 miles southeast of, northeast corner of cross roads, near stone post; iron post stamped "466"	465.803
St. Charles station, 2.8 miles southwest of, center of T road east, on top of stone; chiseled square marked "436.2"	436.45

St. Charles station, 3.8 miles southwest of, 1,000 feet north-west of Cranor schoolhouse, northeast corner of road forks, in top of oak stump; copper nail marked "514.5"	Feet 514.72
St. Charles station, 4.2 miles southwest of, east side of road, at T road west; iron post stamped "543"	543.393
Pod, 3.3 miles northeast by 0.3 mile west of, 300 feet east of county line, north side of road, in top of stump; copper nail marked "561.3"	561.60
Pod, 2.8 miles northeast of, woods road to west, 100 feet north of stream crossing, 1.4 miles north of Castleberry Church, west side of road, 18 inches from fence line; iron post stamped "504"	504.307
Pod, about 700 feet west of store, northwest corner of crossroads; iron post stamped "426"	426.727
Pod, 1.4 miles southeast of, at steel bridge over Tradewater Creek, on top of south abutment, east wing wall of; chiseled square marked "438.3"	438.54
Crofton, 6.2 miles west of, 2.5 miles north of Era, 2.9 miles southeast of Pod, at southeast corner of crossroads; iron post stamped "605"	504.749

Near Earlington.

Earlington, 3 miles southwest of, 0.2 mile east of T road south, in north face of northwest corner of Allen Laffoon's dwelling; aluminum tablet stamped "499 1907"	499.182
Earlington, 6 miles southwest of, at southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, 428, 1907"	428.448

From Enon southwest to Fredonia.

Fredonia, 3.04 miles northeast of, 300 feet southeast of T. G. Maxwell's residence, in limestone ledge on west side of road; aluminum tablet stamped "470"	470.367
Fredonia (old town), at southeast corner of T road opposite postoffice, on large stone; chiseled square	421.56
Fredonia (new town), opposite station, in northwest corner of G. H. Rice's field; iron post stamped "402"	402.534

From Princeton via Scottsburg to Claxton.

Princeton, in southwest corner of courthouse yard, 20 inches from corner of iron fence; iron post stamped "488"	488.016
Scottsburg, 100 feet west of station, at northwest corner of Harlan Hoover's residence; iron post stamped "521"	521.241
Claxton, 300 feet north of railroad, in foundation of Illinois Central R. R. section house; aluminum tablet stamped "450"	449.884

From point 2 miles east of Scottsburg south to Cobbs.

Scottsburg station, 1.98 miles east of and 0.88 mile south of, on stone step of Lebanon Baptist Church at Y road; chiseled square painted "587.6"	Feet 587.88
Friendship, at southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 21, 525"	524.807
Friendship, 0.91 mile south of, 100 feet north of T road west, on large limestone rock in center of road; chiseled square painted "482.9"	483.17
Friendship, 2.38 miles south of, west of road near turn in road at creek crossing, on large rock; chiseled square	464.96
Friendship, 3.47 miles south of, in northwest corner of foundation of T. B. Howard's residence; aluminum tablet stamped "508"	508.488

From Enon via Dulaney to point 3 miles northwest of Lamasco.

Crider, 5.75 miles north of, about 4 miles east of Fredonia, at T road, 25 feet east of southeast corner of Tom Blackburn's field; iron post stamped "535"	535.198
Crider, 1.11 miles north of, 500 feet northwest of Bethlehem Church, opposite residence of W. L. Miller, on large rock on east side of road; chiseled square	489.28
Crider, in foundation of cistern top at southeast corner of Crider's store; aluminum tablet stamped "469"	469.662
Crider, 0.25 mile south of station, in front face of northeast corner of foundation of residence of Mr. Crider; aluminum tablet stamped "Prim. Trav. Sta. No. 18, 1907, Kentucky, 475"	475.385
Dulaney, railroad crossing; top of rail	544
Dulaney, 130 feet west of station, 85 feet north of track, between stores of Tom Jordan and Bill Jones; iron post stamped "547"	547.556
Dulaney, 60 feet north of railroad, in southeast corner of foundation of store owned by W. H. Jones; aluminum tablet stamped "546"	546.722
Dulaney, 2.92 miles south of, in southeast corner of crossroads, 20 feet from fence on farm owned by William Garrett; iron post stamped "465"	464.900
Hopson, 9.39 miles northwest of, north of road, opposite residence of L. H. Oliver, on large limestone rock; chiseled square	515.97
Hopson, 8.27 miles northwest of, 50 feet west of T road, 25 feet north of large oak trees, about 0.25 mile north of Friendship Church; iron post stamped "573"	573.015

Near Olney.

Dawson, 4.5 miles northwest of, on rock at east approach south side of bridge over Bull Creek; chiseled square painted "390.79"	Feet
Dawson, 4.87 miles northwest of, in southeast corner of foundation of Union Grove schoolhouse; aluminum tablet stamped "431"	391.04
Kirkwood Springs, 1 mile south of, in southeast corner of Freedom school yard, 2 feet from fence; iron post stamped "543"	431.570
Kirkwood Springs, 0.6 mile north of, on large sandstone rock at west side of road; chiseled square	543.664
	419.94

At Friendship.

Friendship, southeast corner of crossroads, in top of 7-inch square stone; aluminum tablet stamped "Prim. Trav. Sta. No. 21, 525, 1908"	524.807
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From Nortonville east along Illinois Central R. R. to point 1 mile east of Depoy, thence southwest and west to Johnson's postoffice, thence west and southwest to Crofton.

Nortonville, 2.4 miles east of, near north end of west abutment of wooden railroad bridge J 148-55; iron post stamped "395, Ky"	394.948
Bakersport, about 75 feet southwest of water tank on south side of track; iron post stamped "397, Ky"	396.996
Graham, 600 feet west of station, on north side of track, about 100 feet east of switch; iron post stamped "409, Ky"	409.197
Depoy, 0.9 mile east of station, inside right of way, about 60 feet to center of road crossing over tracks; iron post stamped "507, Ky"	506.907
Depoy, about 3.5 miles southeast of, 75 feet to center of road, north side of road, 80 feet east of white-oak tree; iron post stamped "545, Ky"	544.841
Bancroft, 0.8 mile east of, 15 feet south of center of road; cross cut on top of stone	538.48
Bancroft, 75 feet west of Harris & Co.'s store, 20 feet east to center of road; iron post stamped "485, Ky"	485.567
Bancroft, 0.5 mile south of, opposite A. W. McCown's residence, on north side of road; spike in root of walnut tree ..	431.20
Bancroft, 0.8 mile south of, 50 feet north of and opposite residence of Mr. Van Over, on west side of road; spike in root of walnut tree.	447.04
Bancroft, 1.5 miles south of, 25 feet north of center of road, at T road southeast; nail in root of small ash tree.	472.15

Bancroft, 2.6 miles south of, on east side of main road, at forks of road; iron post stamped "451, Ky" ..	Feet
Bancroft, 2.8 miles south of, at T road northeast, on east side of road; cross cut in cement culvert.....	451.044
Bancroft, 3 miles south of, 50 feet south of T road east, on east side of road, in front of Mr. Carey, Jr.'s residence; spike in root of large oak tree	435.23
Bancroft, 3.5 miles south of, on east side of road, at T road west; nail in root of small gum tree	440.63
Bancroft, 3.8 miles south of, at T road east, in front of negro cabin; cross cut in stepping stone	411.33
Bancroft, 3.8 miles south of, at T road northeast, on west side of road; nail in root of small white oak tree ..	439.30
Johnsons, 1.4 miles north of, 600 feet south of schoolhouse, on west side of road, at T road northeast; spike in root of gum tree	450.43
Johnsons, 0.2 mile north of, bridge over Pond River, cross cut on west end of north abutment	478.91
Johnsons, 0.2 mile north of, at southwest corner of wooden bridge over Pond River; iron post stamped "413, Ky"	412.61
Sharber's store, 40 feet west of, in front of store, 1.2 miles west of Pond River bridge; nail in large oak tree.....	413.681
Wynns, 1.5 miles north of, southwest corner of T road west, inside fence; iron post stamped "406, Ky" ..	478.25
Wynns, 75 feet south of postoffice, at forks of road, spike in root of large oak tree	406.849
Wynns, 0.5 mile west of, at northeast corner of T road north; nail in root of small oak tree	519.19
Wynns, 0.6 mile west of, at T road east, east side of road; nail in old stump	562.75
Crofton, 7 miles northeast of, on west side of road, at T road west; nail in root of scrub oak tree.....	565.77
Crofton, 6.2 miles east of, in southeast corner of bridge over small creek; top of bolt	543.30
Crofton, 6 miles east of, on south side of road at T road north, inside fence; iron post stamped "479, Ky"	426.28
Crofton, 3 miles east of, at forks of road, on south side of road, inside fence; iron post stamped "512, Ky".	479.298
Crofton, in front face of Crofton Hotel, at northeast corner; bronze tablet stamped "608, Ky"	512.712
	608.456

From Johnsons south via Apex to Fruit Hill. (This line is Unadjusted and closes 1.2 feet low at Fruit Hill.)

Johnsons, 0.7 mile west of, on north side of road, at T road south; circle marked on large stone	574.21
Pond River bridge, 0.8 mile west of, on south side of road, at T road south; nail in root of large oak tree	602.67

Apex (Crunk's store), 0.8 mile east of, at southwest corner of crossroads; nail in root of large oak tree.....	Feet 673.37
Apex, 400 feet north of postoffice, in forks of and on north side of road, inside fence; iron post stamped "664".....	664.691
Apex, 1.2 miles south of, on west side of road at T road to Crofton; nail in root of oak tree	764.67
Apex, 1.4 miles south of, 500 feet north of store conducted by M. M. Gorden, on east side of road at fork; nail in root of large tree	748.71
Apex, 2.5 miles west of, on north side of road at T road south; nail in root of small tree	648.21
Apex, 2.7 miles west of, at intersection of T roads; nail in oak stump	598.12
Apex, 3 miles south of, on east side of Greenville-Hopkinsville road, in forks of road; iron post stamped "519, Ky".....	519.667
Apex, 3.8 miles south of, on west side of road at T road east; nail in root of large oak tree	493.20
Apex, 4 miles south of, at northwest corner of crossroads; nail in root of large oak tree	497.18
Apex, 5.3 miles south of, on east side of road at T road east; nail in root of oak tree	771.42
Apex, 5.9 miles south of, on east side of road at T road east; nail in large oak stump	798.04
Apex, 6 miles south of, 800 feet north of Judge's Chapel, west side of road at forks; inside fence; iron post stamped "792, Ky"	791.930
Apex, 6.5 miles southwest of, on east side of road at T road; circle on abutment stone of culvert	624.40
Apex, 7 miles south of, on west side of road at intersection; nail in root of small oak tree	611.65
From Fruit Hill west to Crofton. (Run twice.)	
Fruit Hill, opposite postoffice, in face of brick chimney on north side of residence of David Smith; aluminum tablet stamped "Prim. Trav. Sta. No. 6, 641, Ky"	642.049
Fruit Hill, 4.5 miles west of, on Crofton-Fruit Hill road, in front face of brick foundation 2 feet south of front steps to residence of Lem Davis; aluminum tablet stamped "557"	558.852
From Fruit Hill east along highways to point 1.15 miles east of Todd-Christian County-line stone. (Run twice.)	
Bluff Springs, opposite postoffice, in southwest corner of Mr. Robinson's front yard; iron post stamped "573, Ky"....	574.258
Kirkmansville, 2.5 miles west of, in top of Todd-Christian county-line stone; aluminum tablet stamped "569, Ky".....	570.129
Kirkmansville, 0.87 mile west of, 370 feet east of yard, 1 foot north of fence, on south side of road, in root of black-oak tree; copper nail	504.38

At Salem Church.

Salem Church, 1.5 miles east of Mortons Gap, in west face of southwest corner foundation pier of church; aluminum tablet stamped "427, 1907"	Feet 426.899
From Daniel Boone along Illinois Central R. R. to Nortonville, thence along Louisville & Nashville R. R. via Mortons Gap to Barnsley.	
Nortonville Junction, 0.7 mile west of, 100 feet east of road crossing, on top of concrete foundation of signal tower; chiseled square marked "412.4"	412.62
Nortonville Junction, crossing of Louisville & Nashville and Illinois Central railroads on main track of Illinois Central R. R.; top of rail marked "408.9"	109.1
Nortonville, 300 feet east of station, 120 feet south of Louisville & Nashville R. R. track, in front wall, east side of First State Bank building entrance; aluminum tablet stamped "Prim. Trav. Sta. No. 3, 408, 1908"	408.466
Mortons Gap, 0.3 mile north of, east side of track, 75 feet east of crossing, at fence line; iron post stamped "451"	451.259
Barnsley, 100 feet west of Louisville & Nashville R. R., in front of St. Bernard Mining Co.'s store; iron post stamped "Prim. Trav. Sta. No. 3, 484"	483.607
From Nortonville south along Louisville & Nashville R. R. via Mannington and Empire to Crofton.	
Nortonville, 3 miles south of, second-class road crossing, 100 feet north of switch stand of switch west to log yard, east railroad right-of-way line, south side of road, at foot of gate post; iron post stamped "411"	410.746
Mannington, 1 mile north of, opposite milepost "N. 92, St. L. 226," in top of south post of rail stand on east side of track; nail marked "420.7"	420.88 424.9
Mannington, in front of station; top of rail.	
Mannington, 300 feet south of station, 300 feet north of road crossing, west right-of-way line, 60 feet north of McIntire's store, at foot of telegraph pole; iron post stamped "424"	423.723
Mannington, 1 mile south of, opposite milepost "N. 90, St. L. 228," in top of south post of rail stand; copper nail marked "437.9"	438.05
New Empire, 600 feet south of station, opposite milepost "N. 89, St. L. 229," in top of north post of rail stand on east side of track; copper nail marked "452.1"	452.24 515.3
Empire, in front of station; top of rail	
Empire station, west right-of-way line, 75 feet west of mail crane, 200 feet south of Empire Coal and Mining Co.'s store, at fence corner; iron post stamped "519"	518.647

Empire station, 0.9 mile south of, opposite milepost "N. 87, St. L. 231," 40 feet north of section post (secs. 14 and 15), in top of north post of rail stand; copper nail marked "589.9"	590.03
Crofton, opposite Louisville & Nashville R. R. station, 90 feet west of track, northeast corner of Crofton Hotel; aluminum tablet stamped "Prim. Trav. Sta. No. 2, 608, 1908"	608.456
Crofton, 0.3 mile west of T road northwest, south side of road forks, in root of tree; copper nail marked "609.3"	609.47

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